

COMPUTERWORLD

House bill would restrict air reservation systems

Alleged advantages of Sabre and Apollo targeted

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. House of Representatives last week put the airline industry on notice that strategic information systems can sometimes provide too much of a competitive advantage.

The House, responding to reports that the two dominant computerized reservation systems have abused their market power, passed legislation that would put new restraints on American Airlines' Sabre system, United Airlines' Apollo system and other airline-owned reservation systems.

The bill would once again try to eliminate the systems' bias toward their respective host carriers' flights and to break the contractual ties that make it very difficult for travel agencies to switch system vendors.

A similar bill is stalled in the Senate because of opposition led by Sen. Wendell Ford (D-Ky.), so enactment would require a tricky end run around Ford's aviation subcommittee. However, the House vote of 230-160 puts more political pressure on the U.S. Department of Transportation to issue its long-delayed reservation system regulations, perhaps as early as Sept. 1.

Sabre and Apollo officials attacked the bill as regulatory
Continued on page 16

Hughes zeros in on PC costs

BY MICHAEL FITZGERALD
CW STAFF

LOS ANGELES — A year after the Cold War's demise dropped like a bomb on defense contractors, Hughes Aircraft Co. has signed an innovative personal computer purchase agreement designed to help it reshape for the future.

A flexible, "living," two-year Commodities Purchase Agreement that Hughes signed with two Southern California resellers will generate substantially lower PC prices in part through purchasing custom-built PC clones, among other cost-saving measures.

To start, Hughes, with an installed base of 30,000 PCs, should save money dealing with just two resellers instead of as many as 20. The pact comes at a time when the \$7.7 billion General Motors Corp. subsidiary is attempting to build its commercial revenue from 20% to 50% of total sales.

By combining the purchase agreement with a cost-conscious leasing component that is still under negotiation, Hughes' Corporate Action Group took a radical step forward in its approach to cutting costs and changing the status quo at the company. For example, on a cultural level, the pact could pack more punch by persuading Hughes' heretofore decentralized units to buy into the centralized purchase plan to reap lower prices.

"Normal is no longer acceptable," said Vivian Szeto, a Hughes contract negotiator who capped a 15-month process with four months at the negotiating table, pounding out the best deal



Alan Levenson

Berry led the leasing drive at Hughes

she could find.

"This two-part concept was initially thought of as crazy, as it had never been done before," Szeto said. "But we had to say, 'Why do things only because they've been done a certain way in the past?'"

Hughes hopes to benefit not only from lower priced PCs but also from reduced administrative costs and improved turnaround time.

But even Hughes is not sure what it might save because as the company's organization changes, it is uncertain how many PCs it will buy, said Ben Berry, manager of computer services at Hughes. And there is no way of telling how many PC man-
Continued on page 14

APPN patents to be enforced

IBM's decision could cool interest in protocol

BY ELISABETH HORWITT
CW STAFF

RALEIGH, N.C. — IBM stirred up a hornet's nest last week when it warned a gathering of developers that its Advanced Peer-to-Peer Networking protocol — its much-vaunted "open blueprint" for multivendor, enterprisewide communications — is protected by at least eight different patents.

The message from IBM, according to several attendees at a peer-to-peer Systems Network Architecture conference held here, was: "Buy our license, which includes the patents, before you even think about developing APPN network products."

Developers' dilemma

The patent question could well prove to be a stumbling block for would-be APPN developers — at least in the short term. The license for APPN Network Node, which defines the systems that coordinate communications across the enterprise, is not scheduled for general release until next year. In addition, the price has not been disclosed by

IBM. However, industry sources estimated that it will be in the hundreds of thousands of dollars.

Enforcement of the APPN patents could cool whatever enthusiasm the industry has for adopting the protocol as an industrywide standard, sources said.

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MAINFRAME METAMORPHOSIS

Not a disappearing act

BY JOHANNA AMBROSIO
CW STAFF



Robin Jareaux

First in a two-part series on mainframe computing.

The mainframe may be wheezing a bit in its old age, but it is not dead — not by a long shot. In fact, it will survive into the next century, albeit in some new roles, according to users and observers.

What has changed dramatically, users said, is the way they think about host systems. "The mainframe mentality is dead," said Tom Gildea, vice

president of business information services at Helene Curtis, Inc. in Chicago. "The notion of starting with the mainframe as the centerpiece of the computing environment is over." Instead, big iron is perceived by large systems users as just one of many options currently available.

Based on interviews with 40 users, vendors and analysts, it is clear that mainframes are evolving from central, monolithic, applications-based machines into specialized, interconnected
Continued on page 62

Crash test

Mainframe database management systems earn solid user satisfaction grades in the important area of system availability and recovery from crashes

See Buyers' Scorecard, page 66



Product	Score
Software AG's Adabas	8.8
CA's CA-Datcom	8.7
Cincom's Supra	8.6
IBM's DB2	8.2
Oracle's Oracle	7.9
IBM's SQL/DS	7.7

Maximum score: 10

NEWS

- 4** Apple has four new PowerBooks in the oven, two of which can dock to desktop stations and cost less than \$3,000.
- 4** IBM crows about its millionth OS/2 shipment — and Microsoft returns the fire by boasting about Windows NT.
- 6** The state of Wisconsin, using a new set of bidding rules, procures mainframe discounts of about 60% from Amdahl and HDS.
- 8** Lotus will port its business applications to the HP 9000.
- 8** The EISA consortium wants to establish a faster standard for its bus.
- 8** Vendors introduce PCs based on Intel's new 33/66-MHZ DX2 starting at a low \$2,199.
- 10** DEC deepens discounting with cuts and/or credits of up to 35%.
- 12** Storage Tek's Iceberg won't ship until at least the first quarter of '93.
- 14** Legent reassures users of products from the recently acquired Goal Systems that they have no reason to fear their investments.
- 24** It was a rough fiscal year for KnowledgeWare: The company took a 98% hit in profits.

Quotable

"It would be foolish for IBM not to make APPN an open architecture if it wants the protocol to succeed, and here it seems like they are trying to close it. . . . I don't understand IBM."

PAT MAYER
MORTGAGE GUARANTY

On IBM's warning that the protocol is patented.
See story page 1.

DESKTOP COMPUTING

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- 66** Software AG's Adabas gets the gold among mainframe RDBMSs, with Oracle and CA close behind.

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EXECUTIVE BRIEFING

■ The mainframe is not dying, but it is evolving, both technologically and in terms of how major corporations put it to work. Five to 10 years out, big iron will be used primarily as a data server hanging off the network. It will also be more modular and much less expensive than it is today. **Page 1.**

■ The PC marketplace is also changing to meet corporate demands in both pricing and products. Apple, for example, will enhance its popular PowerBook portable line this October with four new models, including two that can be docked to desktop machines. **Page 4.** Hughes Aircraft is making a preemptive strike on PC costs through an innovative buy-and-lease agreement. The highly decentralized company may not see the kind of savings it hopes for, however. **Page 1.**

■ Taxpayer savings of \$1 million to \$3 million annually should result from the state of Wisconsin's data center consolidation plan, which kicked off with some massive discounting from mainframe vendors. **Page 6.**

■ On the heels of yet another delay with its Iceberg disk array, Storage Tek wants users to visit its disk array laboratory. **Page 12.**

■ Congress took a stab at the airline industry last week with a new bill that would limit the use of strategic IS reservation systems. **Page 1.**

■ Legent set some minds at ease last week about its merger with Goal Systems. The company outlined its approach to merging both product lines. **Page 14.**

■ Working in IS at vendor firms may provide insider access to technologies, but IS directors say their staffs face the same career challenges as IS professionals in any company. **Page 84.**

■ Convenience increasingly means having the right card — be it a credit card, an ATM card or, now, a PCMCIA card. The Personal Computer Memory Card Industry Association has spurred development of credit card-size storage devices, modems and now, LAN adapters for notebook computers. **Page 73.**

■ John Seely Brown, director of Xerox's Palo Alto Research Center, envisions tomorrow's computers embedded in the world around us. **Page 79.**

■ Software re-engineering is taking hold in companies that believe they can save on maintenance costs while recasting legacy systems for moves to new platforms. **Page 69.**

■ Microsoft appears to be changing its strategy for LAN Manager, working to bundle LAN Manager elements into its system software: Windows and Windows NT. **Page 45.**

■ Integrating fax and data communications may make sense, but relatively few user organizations are actually doing it. **Page 53.**

■ Computer Associates is launching a new push in the PC software market, trying to leverage its mainframe expertise and its acquisition of PC database supplier Nantucket Software. **Page 37.**

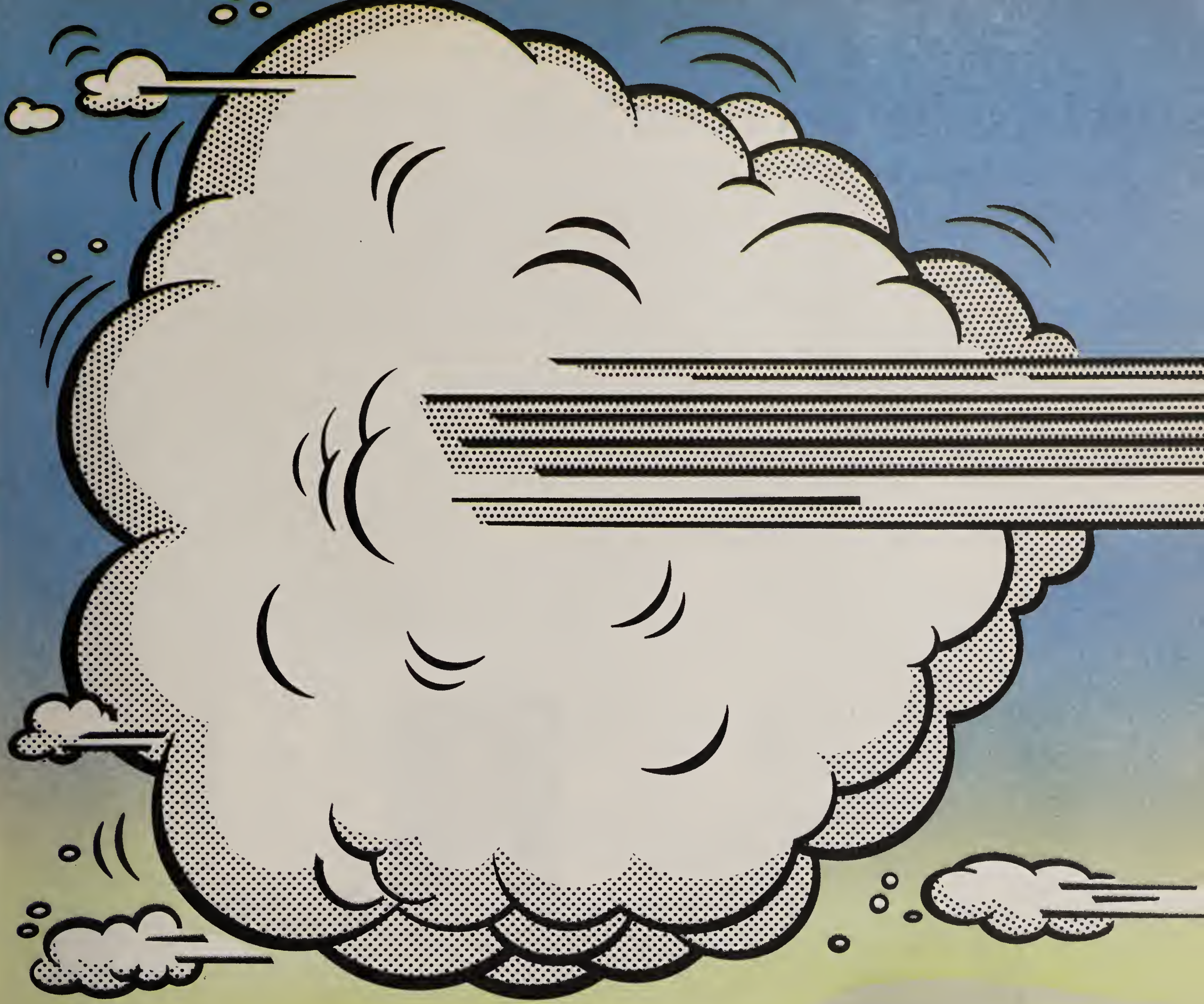
■ Early users of Amdahl's 5995M mainframes say they went to the IBM-compatible system because of the growth path within the product line. **Page 61.**

■ On site this week: The corporate growth of a New York courier service outstripped the abilities of its manual systems as well as its first few tries at computerized order processing. Now Choice Courier Systems is confident a DG Avion system can handle future success. **Page 49.** Standard Register has kicked off a client/server project featuring its mainframe as the server, running Cincom Systems' Supra database management system. **Page 61.**

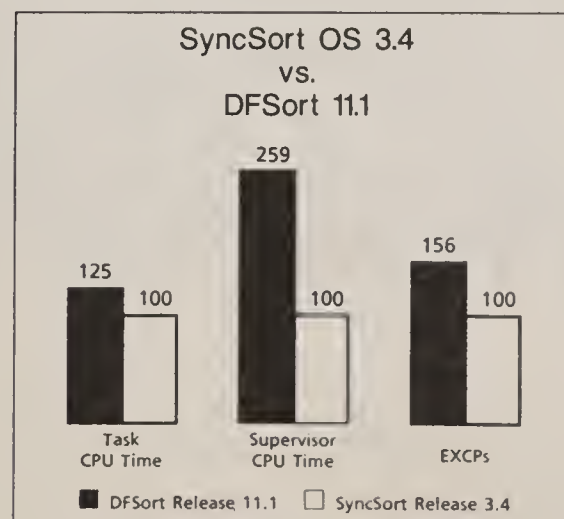
The 5th Wave

Alice in WonderLAN





**HERE'S WHERE WE LEAVE
THE COMPETITION.**



syncsort

Apple readies new PowerBooks

Notebooks, set for fall debut, can dock to desktop stations; cost under \$3,000

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc., which knows a good thing when it sees it, is expected to enhance its popular PowerBook portable computer line this October with four new models, including two that can be docked to desktop machines.

Perhaps the most interesting of the fall rollouts are two models called the PowerBook Duo, which will feature a docking mechanism that when attached to the console will enable the 4-pound machines to act as a desktop computer together. They are expected to sell for less than \$3,000 as a package.

The Model 100 and Model 170 are expected to be replaced with two PowerBooks that are slated to be a pound or more lighter than existing models, run

as much as 32% faster and offer a higher resolution screen.

The rollouts will follow the recent introduction of the PowerBook 145, a replacement for its midrange Model 140, at the MacWorld Exposition in Boston. The new model was designed to run at nearly the same speed as the current top-of-the-line PowerBook 170 [CW, Aug. 10].

Pressure high

In recent months, Apple has faced continual price/performance pressure from increasingly faster and cheaper portables from manufacturers of IBM Personal Computer clones. That has helped prompt Apple executives to reexamine the PowerBook configurations, according to Senior Vice President Roger Heinen.

The new models could open

the PowerBooks up to a whole new class of user, particularly on the low end. So far, sales of the slower and less feature-packed PowerBook 100 have been below expectations, Heinen said.

"The slower speed and lack of an internal floppy really hurt the 100, and it never took off the way Apple thought it would," said Pieter Hartsook, editor of "The Hartsook Report," a Macintosh newsletter published in Alameda, Calif. "If Apple refreshes the low end, it could appeal to a whole new group of users who were never very impressed with the 100."

In May, Chairman John Sculley said that a color PowerBook is in the offing and could be available as early as the first quarter of 1993. Additionally, Apple has said it will open up its distribution channels by selling several Macintosh models, including

members of the PowerBook line, through retailer Sears, Roebuck and Co.

Apple has also moved toward attracting users of IBM-compatible portables with its SuperDrive, a 1.4M-byte drive that can read, write and format DOS and OS/2 disks and that all the PowerBooks either have or can accommodate.

Big business

PowerBooks have been a brisk seller overall since they arrived in October 1991. They are on their way to becoming a billion-dollar annual business for Apple, according to Sculley.

That is expected to continue as the PowerBooks ride a market dynamic: Sales of notebook PCs are expected to make up more than half of the nearly 5 million mobile PCs projected to ship in 1995, according to Norwalk, Conn.-based research firm Inteco Corp. Apple executives are counting on the PowerBook to ride the crest of that wave through a series of price cuts and performance enhancements.

Paradox 4.0 is shipped

BY CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. finally shipped its Paradox Version 4.0 relational database last week.

The product boasts much-improved performance, according to the company. Indeed, Borland claims the recent release will perform as much as 10 times faster than the current Paradox 3.5. The package was expected to ship earlier this year but was delayed to allow Borland to complete extensive beta testing, the company said.

Neal Hill, senior software analyst at Forrester Research, Inc., said the most significant enhancement came in query response times on multiuser systems. "In some instances, the performance is from 8 to 10 times better," he said.

IN SOME instances the performance is from 8 to 10 times better."

NEAL HILL
FORRESTER RESEARCH

Hill indicated that users can now decide whether a query will be restarted each time a table is updated, as in the current version, or be continued using the previous data, which is a much faster technique. "Rather than think for the users, [Borland] will let the users think for themselves," Hill said.

Paradox 4.0 supports the DOS Protected Mode Interface memory management in Microsoft Corp.'s Windows 3.0 and higher, allowing it to run in Protected Mode under Windows.

Development via GUI

The Paradox Application Language has been improved to let users develop applications with mouse support, pull-down and pop-up menus and dialog boxes.

The product supports SQL connections with a variety of databases, including Oracle Corp.'s Oracle 6.0, Microsoft's SQL Server, IBM's OS/2 Database Manager and Digital Equipment Corp.'s VAX Rdb/VMS 4.1.

The Paradox interface has also been enhanced to be more Windows-like with pull-down menus and a more graphical feel.

The product is available for a list price of \$795. A local-area network license is available for \$395 for each additional user.

IBM ships millionth OS/2; Microsoft rather 'amused'

BY ROSEMARY HAMILTON
CW STAFF

Last week, IBM pulled off what some industry observers thought was almost impossible: It passed the 1 million mark for OS/2 2.0 shipments.

Within hours of IBM's announcement, Microsoft Corp. challenged the total as "suspect." To show that it can also play the numbers game, Microsoft reported it had shipped 10,000 Windows

New Technology (NT) developer's kits since early last month.

Even though industry analysts said the IBM number is probably overblown because it likely includes thousands of give-

aways, they also said it shows that OS/2 will carve out a respectable niche, particularly among corporate users.

"It says IBM is gaining serious consideration in many accounts," said Tim Bajarin, president of Creative Strategies International, Inc. in Santa

Clara, Calif. He said that when giveaways and IBM internal users are cut from the total, the actual shipment number is closer to 700,000, "which I think is still quite significant."

Bajarin and other analysts predicted that IBM will pass the 1.5 million to 2 million mark by year's end. IBM said a 2 million-plus estimate was reasonable.

Dwayne Walker, director of Windows NT and networking products at Microsoft, said IBM's current total is meaningless unless you look at other factors, such as actual usage, application support and OEM support.

"On the one hand, we



IBM's Cannavino: Three-quarters of number are new OS/2 converts

are somewhat amused," Walker said. "They aren't talking about usage numbers, nor are they talking about how many applications are shipping that directly exploit the OS/2 environment. We are outselling IBM massively every single day."

He said the latest tally on NT developer's kits, which averages out to roughly 300 shipments per day, illustrates Microsoft's momentum in the desktop market.

Not surprisingly, James Cannavino, an IBM vice president and general manager of the Personal Systems Division, said the IBM numbers speak volumes for the success of its newest operating system. He said about one quarter of the total is composed of upgrades from the OS/2 1.3 base, while the remainder is classified as new 2.0 users that come primarily from the DOS or Windows user base.

Industry analysts said both IBM and Microsoft are using their latest numbers as just the newest weapons in the ongoing desktop war. While Microsoft challenges IBM with hiding 2.0 giveaways in its total, it likely has its share of freebies among the 10,000 NT developer's kits as well, analysts said.

"The bottom line is that some people expected 2.0 to be dead out of the block," said Bill Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "One million is enough to get some critical mass."



Microsoft's Walker: Actual usage, OEM support must be considered

Could have done it better

On hearing that IBM's OS/2 2.0 shipments had passed the 1 million mark, one industry analyst joked that he was surprised IBM had reached that point because it "did so many things wrong."

James Cannavino, vice president in charge of IBM's Personal Systems Division, certainly would not phrase it that way. But he agreed last week that "in reality, we could have done a better job" handling some portions of the 2.0 rollout.

IBM had planned a very aggressive marketing campaign in the weeks following the March 31 debut of 2.0. But the company did not pull that off, in part because it was so tied up with organizing its 2.0 distribution and support mecha-

nisms. "We spent more time than we would have liked getting the channels loaded and the support system in place," Cannavino said.

The question, then, is why wasn't IBM ready, given the strategic importance of OS/2 to the company?

"That's a fair criticism," Cannavino said. "We worked very hard to get the product the way we wanted it, and that team building the product used up all the time we had. So the rollout was kind of slowed."

Despite the initial glitches, Cannavino said that he is impressed with 2.0's progress and is planning to release the previously promised aggressive marketing campaign in the coming weeks.

ROSEMARY HAMILTON



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NEWS SHORTS

Report slams cover-up

The House Judiciary Committee approved along partisan lines a staff report accusing senior officials at the U.S. Department of Justice of stealing case-tracking software from Washington, D.C.-based Inslaw, Inc. It also called for an independent counsel to probe the affair. Inslaw charged, and two federal courts have agreed, that officials under former Attorney General Edwin Meese stole Inslaw's software and conspired to drive the firm out of business. The court decisions were later thrown out on jurisdictional grounds. Committee chairman Jack Brooks (D-Texas) said, "The evidence . . . clearly raises serious concerns that a high-level conspiracy against Inslaw did exist and that great efforts have been expended by the [Justice] Department to block any outside investigation into the matter."

ComputerVision IPO debuts at \$12

ComputerVision Corp. went public last Friday at \$12 per share. Prime Computer, Inc. had first cut the stock's asking price from \$20 per share to between \$14 and \$16 and then to \$12 since a June initial public offering (IPO) filing. A spokesman for Shearson Lehman Brothers, Inc., Prime's primary bondholder, blamed the dropping stock price on "deteriorating market conditions for IPOs." At press time, 4.8 million shares had traded, and the \$12 price remained steady.

Industry backs free trade

The computer industry gave a tentative thumbs-up last week to the U.S.' free-trade agreement with Canada and Mexico. While the details have not yet been made public, the accord is said to provide for duty-free movement of computers among the three countries if they contain motherboards assembled in North America. Trade associations said they were pleased by reports that the agreement contains strong provisions for protecting patents and software copyrights. Congressional approval of the deal is not assured, sources said.

Interface links NetView, DECMcc

Phoenix Network Technologies, Inc. announced Six2View, said to be an interface between IBM's NetView and Digital Equipment Corp.'s DECMcc network management systems. The Six2View server will reportedly collect DECnet alerts from multiple DECMcc stations and send them onto NetView via the IBM LU6.2 connection supported by NetView Version 2 Release 2. The initial release is scheduled for this month.

X/Open, OSF eye DCE integration

The X/Open Consortium Ltd. and the Open Software Foundation (OSF) last week pledged to integrate the OSF's Distributed Computing Environment (DCE) specifications into X/Open's Common Applications Environment, a set of de facto and international computing standards for multivendor interoperability. Pulling DCE into X/Open's standards environment will flesh out X/Open's distributed computing framework by supporting personal computer and mainframe systems as well as Unix systems.

Short takes

Novell, Inc. announced a 128-session version of its NetWare for IBM's Systems Application Architecture (SAA) local-area network-to-host connectivity product. A promotional conversion program running through Jan. 31 lets users trade in old non-Novell Systems Network Architecture gateways and upgrade to the NetWare for SAA platform at a reduced price. . . . **Data General Corp.**'s OpStar storage family now supports write-once read-many and rewritable storage on the same subsystem. . . . **Beyond, Inc.** began shipments of electronic-mail software for **Microsoft Corp.**'s Windows. BeyondMail includes advanced functions such as rules-based formulas that allow users to construct work-flow and workgroup applications. . . . **BellSouth Telecommunications** deployed a 2.5G bit/sec. Synchronous Optical Network system between the island Grenada and Tupelo, Miss., a primary network route in the state.

More news shorts on page 16

State wins big in host price war

Data center consolidation could save Wisconsin \$3 million annually

BY JEAN S. BOZMAN
CW STAFF

MADISON, Wis. — The state of Wisconsin expects to save taxpayers \$1 million to \$3 million annually under a data center consolidation plan that offers the added benefit of finessing discounts of more than 60% from heavily contested bids for two mainframes.

Industry analysts said it was one of the highest discounts they have seen in a period of high discounting activity among vendors [CW, Aug. 10].

The discounts were made possible by a 1991 act

of the Wisconsin legislature that allowed the utility to vary the bid specifications during the negotiating process and to request additional rounds of bidding. Previously, state officials were tied to seeking out competitive bids for specific sets of requirements that could not change.

"The legislature exempted us from state procurement laws and regulations, so we're now able to buy computers just like anybody else," noted Neal Steinhoff, administrator of Wisconsin's division of information technology services, or Info-Tech Services, computer utility. The 1991 legislation created a statewide computer "utility" to operate all state data centers. The utility is consolidating three of the state's six data centers in a new building within blocks of the state capitol. It will employ 91 information systems staffers — 30 less than the state had before.

Big savings expected

After completing the consolidation in December, IS costs are expected to drop by \$1 million to \$3 million a year. Up-front costs, exclusive of the computers, include \$5 million to construct raised-floor computer rooms in two stories of a new 10-story state office building.

The new 350 million instructions per second mega-data center will house two new mainframes: an Amdahl Corp. 5995M Model 4550, slated for installation late this month, and a Hitachi Data Systems Corp. GX 8320, which was installed in mid-July. The state spent about \$23 million for the two mainframes and used 500G bytes of disk drive capacity. The HDS machine was acquired by trading in an existing HDS EX 310, but the vendor provided at no cost 1G byte of solid-state disk capacity and training worth \$250,000.

The state traded in an IBM 3090 Model 300, an IBM 3090 Model 500 J and an Amdahl 5890 Model 300 E as part of the two mainframe deals.

"They really wanted the business," Steinhoff said of the IBM-compatible mainframe vendors.

The Amdahl machine was technically acquired at 57% of list price, but after adding in maintenance credits, the total came to 64% of the list price.

IBM was the odd vendor out in the bidding, ending up with a contract for just \$2.5 million in yearly system software revenue and about \$300,000

in cartridge tape drives and printers.

Wisconsin's computer utility hired consultants from Ernst & Young, Andersen Consulting and Gartner Group, Inc. to guide state IS managers as they prepared their requests for proposals and evaluated bids.

Throughout two rounds of bidding, consultants sat in nearby rooms, totaling up the value of hardware and services provided at no cost, or "soft" credits.

"We validated the numbers by coming up with a number that represents the value of the 'soft' credits thrown in by the vendors," said Jann-Marie Halvorsen, director of financial advisory services at Gartner Group. These soft credits included train-

ing, software, upgrades and maintenance services, she said.

During the height of negotiations, "we told the vendors when they were high and when they were low," said James Klauser, secretary of Wisconsin's department of administration that operates the Info-Tech utility. "We didn't whipsaw them. We just let them know where they were [in the bidding] and pressured them to negotiate."

Way off

Steinhoff said IBM's bid missed the mark by \$4.5 million, including CPUs and disk drives. Under IBM's bid, Wisconsin would have paid \$27.5 million instead of \$23 million. "We told them they were off by millions of dollars, and they didn't respond. They said they were giving us the best price they've given anywhere, and they didn't believe us. I wanted IBM, but I wasn't about to pay millions extra for it."

The consultants' logistical support maintained an apples-to-apples comparison that resulted in low prices — and guaranteed upgrade costs at flat rates through 1995.

Wisconsin promised it would have a mixed-vendor shop when it handicapped the first winner, HDS, by adding a \$1.5 million premium to its bid during the second round of negotiations. "We thought it would be worth \$1.5 million to us to have a mixed-vendor shop, to have technical support from two companies and to have competition on the next upgrade." The deals were signed in June.

Help from above

The state of Wisconsin would not have been able to play hardball during two rounds of mainframe bidding without an extraordinary level of support from the state's legislature and its administration — from the governor on down.

In 1987, newly elected Gov. Tommy Thompson expressed an interest in trimming state IS costs and in making Wisconsin's use of information technology more efficient. Two years later, he formed a committee of experts from private industry, state agencies and Wisconsin data center managers to study the problem. In January 1990, the committee hired Ernst & Young to help draft recommendations for state action.

"We started a project called ITSPI, for the Information Technology Strategic Planning Initiative," said Bruce Jacobs, senior manager at Ernst & Young's management consulting group in Indianapolis. "It was an effort that involved more than 20 state agencies, 20 consultants and as many as 100 people at its peak." The committee's study, delivered in March 1991, recommended consolidation and competitive bidding.

Called Info-Tech Services for short, the computer utility was able to bypass many provisions of the state's procurement laws, allowing it to act much more like a private corporation. "State procurement law prevented Wisconsin from getting good deals because it didn't allow them to go back and get multiple passes at vendor bids," Jacobs said.

JEAN S. BOZMAN

**WHAT HAVE
BILL GATES,
SCOTT MCNEALY,
JOHN SCULLEY,
JOHN YOUNG
AND LARRY ELLISON
AGREED TO
COOPERATE ON?**

New DX2 systems enter PC fray

33/66-MHz clock-doubling chip spawns barrage of microcomputers

BY CAROL HILDEBRAND
CW STAFF

The unabating PC price wars, coupled with a desire to lure users into embracing the 486 platform, had vendors last week introducing their new high-end machines at low-end prices.

"Usually when you see the introduction of a new processor, you see machines that carry somewhat of a price premium. This time, the vendors are jumping right by that stage," said Matthew Cain, an analyst at Meta Group, Inc.

A whole slew of personal computer vendors last week announced machines based on Intel Corp.'s new 33/66-MHz clock-doubling DX2 chip [CW, Aug. 10]. Companies including Compaq Computer Corp., Digital Equipment Corp., Dell Computer Corp., Advanced Logic Research, Inc. (ALR) and IBM entered the fray with machines that started as low as \$2,199.

The DX2 33/66 machines will not have an immediate broad-based appeal for users, analysts predicted, although certain power-hungry segments will snap them up.

Eric Singleton, information systems director at the Orange County, Fla., appraiser's office, is one such user in search of power. Singleton's shop recently moved from a mainframe environment to PC local-area networks, and he said he was very interested in the new machines, particularly at the prices announced. "It's very satisfying that the price trend is continuing, even with the new chips.

We're not just getting rock-bottom pricing on yesterday's technology," he said.

Pricing was clearly the paramount issue as vendors vied to have the most competitive machine. For example, ALR lowered prices on its new boxes a scant few hours after they were

MHz 386SX box has dropped 31% during the last seven months. "The 16-MHz 386s are dead, and the 20 MHzs are dying," he said.

By pricing the DX2 attractively, Intel is enabling PC vendors to pass the savings on to end users in the form of low-priced

Priced to move

Many DX2-based PCs unveiled last week sport aggressive price tags, in spite of the premium chip inside

	Name	Hard drive	RAM	Price
DEC	DECPC 466ST	245M-byte IDE drive	4M bytes	\$4,319
Compaq	DeskPro 4/66i Model 120	120M-byte drive	4M bytes	\$2,249
Dell	Performance 486P/66	120M-byte drive	4M bytes	\$2,499
ALR	Flyer 32DT 486DX2/66 Model 120 DW	120M-byte drive	4M bytes	\$2,499

CW Chart: Michael Siggins

first announced to position them several hundred dollars under Compaq's price point.

Analysts said the actions were dictated by several issues. The continuing price wars played a part as vendors struggle to stay competitive.

A second factor was Intel's processor strategy. Analysts said the company is hoping to coax as many users as possible over to the 486 platform before it introduces its next-generation chip, the P5, early next year.

John Murphy, editor of "The PC Street Price Index" in Cherry Hill, N.J., pointed out that the price of a fully configured 25-

boxes, a trend backed up by market research estimations.

Richard Zwetchkenbaum, an analyst at Framingham, Mass.-based International Data Corp., cited figures showing that 33.8% of all IBM-compatible PCs shipped in the U.S. in 1992 will be 486s, compared with 8.3% in 1991. At the same time, he said he expects a 19% price drop in 486DX systems, compared with a 7.5% price decline for IBM-compatible machines overall.

"It's not that the price war is over; it's that people are buying more powerful systems," Zwetchkenbaum said.

EISA consortium's push for faster bus begins in earnest

BY MICHAEL FITZGERALD
CW STAFF

The Gang of Nine may ride again, according to industry sources.

Behind the new activity from the Gang of Nine — also known as the Extended Industry Standard Architecture (EISA) consortium — is a desire to establish a new, faster specification for its EISA bus, sources said recently. The new bus probably will not appear in systems much before the end of 1993 and will probably be concentrated in the multiprocessing server market.

EISA machines can transfer data at 32M byte/sec. right now, and the "Fast EISA" specification would allow for 133M byte/sec. Analysts and users have said that problems with bus I/O

speeds can impede data flow, which is important to high-powered servers.

The EISA consortium was started by Compaq Computer Corp. when IBM introduced the Micro Channel Architecture (MCA) bus. The group released EISA in November 1989. EISA members have continued to meet informally, but a push for a new bus by several lesser lights of the consortium met recently with approval from Compaq and AST Research, Inc., signaling a shift in both companies' previous stance on changing EISA.

One reason may be that this emphasis on servers could give EISA the market presence it has failed to establish in the desktop market.

"The only place where [EISA] matters is on multiprocessors,"

said Kimball Brown, an analyst at International Data Corp. in Mountain View, Calif.

At the EISA group's most recent meeting held July 8 at Wyse Technology, Inc., representatives of Compaq and AST decided to put their weight behind a new specification that will quadruple the EISA bus' throughput to 133M byte/sec.

According to the sources, Digital Equipment Corp., Corollary, Inc. and Distributed Processing Technology, a disk controller manufacturer based in Maitland, Fla., pushed the new design, but Compaq demurred, initially saying it did not want to rock the boat on EISA.

Fear, uncertainty, doubt

Compaq and AST have shifted their thinking because of "a combination . . . of IBM ramping up — we've got FUD to fight — but also, with the advances we're seeing in processor capabilities, we're beginning to see that we're going to want a faster

Lotus strikes suite deal with HP for Unix apps

BY MARYFRAN JOHNSON
CW STAFF

PALO ALTO, Calif. — Hoping to boost sales of its Unix workstations in commercial accounts, Hewlett-Packard Co. last week struck a deal with Lotus Development Corp. to bring its full suite of business applications to HP 9000 workstations and server platforms.

By early next year, HP/UX Unix users should be able to run Lotus' Notes, CC:Mail, AmiPro and Freelance Graphics. Already available on HP 9000 platforms are the Lotus 1-2-3 spreadsheet and Lotus Realtime products.

Lotus also has Unix plans with IBM and Sun Microsystems, Inc.

"Having Lotus on your products is a signature of credibility in the marketplace," said George Weiss, an analyst at Gartner Group, Inc.

While HP may be gaining a showcase set of business productivity applications, several analysts said Lotus stands to benefit even more by expanding its Notes groupware application beyond Intel Corp. and IBM OS/2 platforms into more powerful, networked Unix environments.

"You can't go into a Fortune 500 company and make a pitch only for Intel machines," said David Rome, general manager of the Unix business unit at Cambridge, Mass.-based Lotus.

The HP/Lotus deal will require some tinkering to integrate CC:Mail and HP's Open-Mail electronic-mail systems. Yet company officials said the

two products will "play well together," giving customers access to HP's messaging backbone through the familiar client user interface of CC:Mail.

Running Lotus applications on HP machines might also appeal to workplaces where technical users trade up to more powerful workstations and hand down their old machines to other staff members. "Managers like to run under one similar operating environment and save administrative costs," said John Logan, an analyst at Aberdeen Group in Boston.

Scientists and engineers also have to write memos and proposals, analyze statistics and churn out technical reports.

"We are seeing more and more of what you'd consider standard business applications being ported to Unix machines," said Mike Horgan, a systems engineer at Hughes Data Systems, Inc. in Anaheim Hills, Calif. Yet when Horgan received a free copy of Lotus 1-2-3 with an HP 9000 Model 710 workstation, he never loaded it or used it.

"We use our Unix workstations for engineering-type applications and strictly PCs and Macs for desktop work," Horgan explained.

Then again, as prices for low-end workstations plummet into the high-end personal computer space, Horgan and other users said they could envision a greater interest in trying out business applications under Unix.

Senior editor Rosemary Hamilton contributed to this story.

bus," said Michael Krieger, AST's director of advanced systems marketing.

IBM recently made significant enhancements to MCA, doubling its throughput capability in a recent Personal System/2 Model 95 announcement.

A Compaq spokesman acknowledged that "there is a perception we've dragged our feet on [a new EISA bus], but it's entirely because we don't think there's a market for it yet." He said Compaq has versions of a new EISA bus running in its laboratories. He added that Compaq thinks the product has a future but is not needed until faster subsystems exist. Neither Compaq nor AST see the current EISA initiative as written in stone.

Analysts contacted agreed that demand would probably be slight right now.

"The server makers desperately want parity checking, but I don't think it's of much concern to end users yet," said Leslie

Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn.

The Compaq spokesman said the new EISA bus will not appear in systems this year, and sources at other companies in the group agreed that no product plans including the bus are on the board.

Some of the original Gang of Nine are less active in this reinvigorated group. Most of the gang consists of companies with an interest in multiprocessing.

CORRECTIONS

In "User group offers .INI editing relief" [CW, July 20], a contact number for the Windows Users Group Network was left out. The number is (215) 565-1861.

.....

The Foundation computer-aided software engineering tool set was incorrectly attributed to Arthur Andersen & Co. in the Aug. 3 Buyers' Scorecard. Foundation is a product of Chicago-based Andersen Consulting.

A COOPERATIVE-SERVER DATABASE FROM ORACLE

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*Bill Gates
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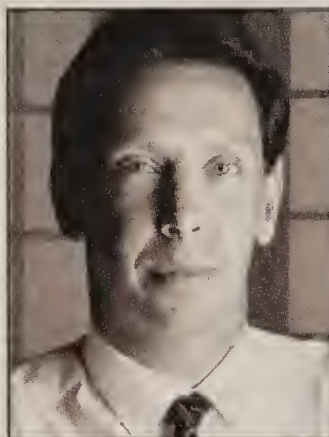
"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

*John Sculley
Chairman and CEO
Apple Computer, Inc.*



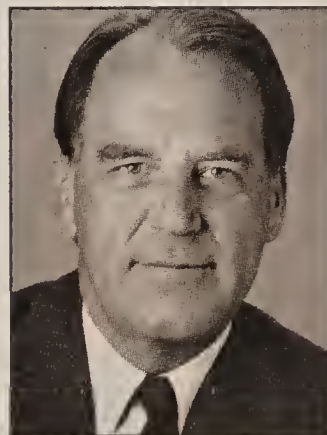
"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

*Larry Ellison
President and CEO
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*John Young
President and CEO
Hewlett-Packard Company*



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DEC expands credits to drive customer demand

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. has aggressively expanded its discounting credit mechanisms in an effort to pump up sales and improve its financial picture, according to industry analysts.

DEC has been offering greater user "allowances," or credits. So far the allowances, along with discounts, have in the best cases amounted to price cuts of as much as 35% for VAXs, analysts said.

Although these deals are not generally as economical as those occurring in the mainframe market, for example [CW,

Aug. 10], DEC is feeling the heat generated by the pricing policies of IBM and others.

"If you look at the big picture, DEC is under a lot of pressure to keep the sales momentum up," said Ray Small, program director of Financial Strategies Services at Gartner Group, Inc., a market research firm based in Stamford, Conn. "Across the board, pricing is being gutted by 40%. Hardware is becoming a commodity — I wouldn't be at all surprised to see this level of discounting holding up."

He said the best DEC deals have been in the area of 30% to 35%, which he described as "aggressive."

Small added that the lower prices often come in the form of discretionary allowances rather than a "discount, but it amounts to pretty much the same thing," he said.

DEC officials, however, refused to confirm this as a strategy. "I don't believe it's a trend, though there may be a point here and a point there," a DEC spokeswoman said. "In fact, we have seen allowances go down with the advent of user licenses."

DEC is also looking to expand its customer base beyond VMS and Ultrix. Toward that end, the company will offer Alpha migration tools targeting competitors' platforms, including IBM's

System/36, System/38 and Application System/400 and systems from Wang Laboratories, Inc., Unisys Corp. and Prime Computer, Inc., internal sources said.

DECstation users frustrated by DEC's earlier policy of not porting OSF/1 to their platforms [CW, May 18 and 25] can instead look forward to tools that will ease the migration to Alpha OSF/1. These are expected to be announced next month at Unix Expo, according to internal DEC sources.

Industry analysts praised the GEM compiler technology and PALcode layer in Alpha, which make it possible for applications to be moved across to Alpha "fairly easily," but said that having such capabilities will not ensure sales by any means.

"DEC still has to overcome political barriers and convince users that it will work," said Chris Christiansen, research director of multiuser systems at International Data Corp., a market research firm based in Framingham, Mass.

While DEC attempts to generate revenue to ease its financial position on the one side, the streamlining of operations on the other is taking a variety of forms.

Wiring board unit sold

Even as DEC managers begin to implement significant layoffs, DEC sold its Greenville, S.C., Printed Wiring Board facility to AMP-AKZO Corp., a Hauppauge, N.Y., printed wiring board manufacturer. AMP-AKZO will take over the DEC facility and will offer employment to the 475 employees currently working there, DEC officials said.

AMP-AKZO is a joint venture between \$9 billion AKZO, based in Arnheim, The Netherlands, and \$3 billion AMP, Inc. in Harrisburg, Pa. DEC officials said DEC is seeking to specialize more than it has in the past via the sale.

"Our manufacturing strategy is to return to our core competencies and to de-invest in those areas where we can't differentiate ourselves," a DEC spokeswoman said.

USX spins off IT subsidiary

PITTSBURGH — USX Corp. last week spun off a separate information technology subsidiary designed primarily to provide systems integration, consulting services and computer resources to other process-industry companies.

The new unit, which is part of USX subsidiary USX Engineers and Consultants, Inc., will be led by Norbert J. Connors Jr. Connors, who had been general manager at USX's computer technology unit since 1987, is now vice president of information technology at the newly formed group.

The 100-person information technology unit has evolved during the past five years, as USX's computer technology unit began handling the computing requirements for USX divisions that were either spun off or sold during that time, according to Connors.

In 1991, USX entered a joint venture with Kobe Steel Co. in Japan to form USX-Kobe, a galvanized steel manufacturer. Connors said the computer unit developed an order-entry tracking system for the joint venture.

THOMAS HOFFMAN

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GSA Contract Number GS00K90AGS5251-PS02

SPARC tool moves firm to open systems

BY ELISABETH HORWITT
CW STAFF

MENLO PARK, Calif. — Network General Corp.'s Sniffer is finally moving out of its proprietary isolation but not quite fast enough for users who want to integrate the local-area network analysis tool with their Simple Network Management Protocol (SNMP)-based integrated LAN management platforms.

Tools such as Sniffer monitor the LAN and perform in-depth analysis to determine the exact source of problems.

Last week, Network General announced Sniffmaster for X (SM/X), a Sun Microsystems, Inc. SPARCstation version of Sniffer that can run concurrently on the same SPARCstation as Hewlett-Packard Co.'s OpenView, Sun's SunNet Manager or Cabletron Systems, Inc.'s Spectrum, the company said.

However, co-residence is still a far cry from what users want: to perform the full range of network management tasks, including LAN analysis from one system, said Ginny Mellinger, a senior analyst at International Data Corp. in Framingham, Mass.

"It's a step in the right direction to have Sniffer on SPARCstation, but I am pushing them to support RMON [Remote Network Monitoring] on their servers," said Peter Ho, a senior network systems engineer at Los Angeles oil firm Unocal Corp. RMON support would let SM/X interact with Unocal's existing SNMP-compatible system.

Network General is moving to address user integration needs in the following ways:

- Integrate SM/X with Novell, Inc.'s Network Management System and SunNet Manager.
- Announce an expert system version of Distributed Sniffer in the first quarter of next year.
- Announce this week a joint agreement with Cabletron to integrate SM/X with Spectrum.
- Extend Sniffer servers' currently limited SNMP support and add RMON next year.

SM/X is said to offer significant savings by sharing a console with a Unix-based network management system such as SunNet Manager.

Each DOS-based Sniffer user also requires a dedicated console, at a total cost of about \$8,000 per user. In contrast, one SM/X system can serve multiple network managers equipped with X Window System terminals or X workstations.

SM/X is slated to ship next month for \$7,995.

Frosted Storage Tek users to see Iceberg

BY JEAN S. BOZMAN
CW STAFF

LOUISVILLE, Colo. — Storage Technology Corp. last week again invited users to visit its Iceberg disk array laboratory here, following the disclosure of a second delay that will push first shipments into the first quarter of 1993 at the earliest.

The prolonged delay [CW, Aug. 10] is slowly eating into Storage Tek's time-to-market advantage over competitors IBM, Hitachi Data Systems Corp., Amdahl Corp. and Memorex Telex N.V., which are also preparing high-capacity IBM 3990-compatible RAID-5 drives. EMC Corp. in Hopkinton, Mass., already markets an IBM-compatible RAID-1 product that handles disk mirroring.

Behind the delay are problems with redundant arrays of inexpensive disks (RAID)-specific coding, said David Weiss, senior vice president of marketing at Storage Tek. But basic microcode work that duplicates the function of IBM's 3990 controller for Iceberg is finished, he said. Weiss said Storage Tek engineers had underestimated the amount of time the microcoding would take.

Tricky coding

Industry analysts said they believe Storage Tek is still struggling with some unanticipated problems. "It's a technical, complicated product, and they're not finding it easy to write the microcode required to do all the advanced functions," said Bob Calery, an analyst at Technology Investment Strategies Corp. in

Framingham, Mass.

Iceberg is based on disk drives from Hewlett-Packard Co. and a proprietary controller that delivers IBM 3990 functions along with RAID's disk

do what it was supposed to do."

Earlier this year, information systems manager Joe Novoskielski told *Computerworld*: "We will sweep the floor with Iceberg and ... replace every-

er things out there," Moore said, pointing to IBM's enhanced 3390 drives.

IBM's triple-capacity version of its conventional high-end IBM 3390 disk drive will impact Iceberg sales, predicted Paul Wolfstaetter, program director at Gartner Group, Inc.'s Large Computer Strategies Group.

"There's no learning curve for the customer, and the list price for the triple-capacity drive will be \$3 to \$5 a megabyte," he said, compared with Iceberg's \$6 to \$10 per megabyte.

Quality argument

Storage Tek defended its policy of taking more time to prepare the Iceberg product for market, saying it would preserve quality control. Securities and Exchange Commission rules required that the delays be revealed, Weiss said.

"It's not like the proverbial delay in your airline flight, where you only hear about the delays a half-hour at a time," Weiss said. "We can see the end of the new function we have to code, and we believe this [schedule] is a correct assessment of what we can do."

Upon news of the delays, Storage Tek's stock dropped Aug. 10 by more than 6 points to 27¼, just above its 26¼ low for the year. At press time last Friday, it increased to 29¼.

Original plans called for Iceberg to double Storage Tek's sales in a few years. But the company announced 10 days ago that Iceberg beta testing would be delayed until the fourth quarter and that Iceberg would not be shipped until first-quarter 1993.

Melting market potential

When Storage Tek finally rolls out the Iceberg, its reception may be less than desirable

What do you think of Iceberg?

Would acquire/evaluate the product

Have no interest

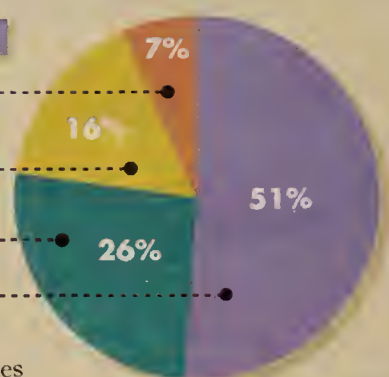
Attractive

Would consider it but is a low priority

Survey base: 171 ES/9000 and 3090 sites

Source: International Data Corp.

CW Chart: Stephanie Faucher



mirroring and error-recovery features. Users had ordered some 140 Iceberg units for early shipment. About 1,200 orders were expected through 1993.

Shared Medical Systems Corp. is one customer that plans to visit Storage Tek's laboratories this week to view 15 working Iceberg models hooked up to IBM Enterprise System/9000 and IBM 308X mainframes. The Malvern, Pa.-based provider of data services to hospitals and medical clinics has big plans.

"We have someone going out to Storage Tek on Monday and Tuesday," operations manager Joe Falco said. The firm, which has 2T bytes of disk drive capacity, had an Iceberg on order for installation in the fourth quarter, he said. "It was one unit for evaluation of whether it was going to

thing in the shop," if it performs as advertised [CW, Feb. 3].

However, some users have already said they will not take Storage Tek's offer of an inspection tour. Mellon Bank Corp. in Pittsburgh, with 1.4T bytes of disk drive capacity, is planning a trip for early next year, when the product is ready for shipment. "I think it's a shame they stumbled," said David A. Moore, senior vice president of technology, products and services at Mellon, "but if you look at the complexity of the microcode, it was not surprising."

Iceberg represents a low-cost, high-performance alternative to more expensive high-end disk drives, Moore noted. "We're looking at Iceberg from a price/performance and reliability standpoint, but there are oth-

APPN patents to be enforced

CONTINUED FROM PAGE 1

"It would be foolish for IBM not to make APPN an open architecture if it wants the protocol to succeed, and here it seems like they are trying to close it," added Pat Mayer, a local-area network administrator at Mortgage Guaranty Insurance Corp.

With protocols such as Transmission Control Protocol/Internet Protocol gaining ground as rival enterprise networking standards, "IBM should make it as easy as possible" to implement APPN, Mayer added. "It's likely that we will implement APPN, but I think that a lot of vendors that might otherwise have supported it won't now. I don't understand IBM."

IBM APPN architect Marcia Peters provided IBM's perspective. "In my opinion it is impossible to develop [APPN Network Node] products without using technology that is protected by those patents," she said. But this

should "be no surprise" to vendors because IBM announced its plans for licensing APPN Network Node last March, Peters added. "IBM deserves a fair return on its investment" of millions of dollars on developing the architecture, she said.

On the other hand, the cost of a license will be low enough that vendors can price their APPN products competitively, Peters said, declining to be more specific.

Vendors were very surprised by IBM's disclosure, said Don Czubeck, a conference attendee and president of Gen2 Ventures, a Saratoga, Calif.-based research house. "It was well-known that IBM is licensing its source code for the APPN Network Node, but some people didn't seem to know that even if a vendor wanted to write its own APPN software, it will still require a license from IBM."

3Com Corp., Network Equipment Technology, Inc. and Novell, Inc. found themselves above the fray, having already signed up for APPN licenses from IBM under reciprocal technology agreements. On the other hand, Cisco Systems, Inc., Systems Strategies, Inc., Brixton Systems, Inc. and "anyone else who is doing APPN software today has a problem staring them in the face," Cisco spokesman Wayne Clark said. "In the long term, we're interested in licensing APPN Network Node; in the short term, this affects us."

Long reach

Indeed, the patent question extends much further than APPN development, according to Kevin Kalajan, senior product manager at Sun Microsystems, Inc. subsidiary SunConnect. For example, a protocol called adaptive session level pacing, which comes under the APPN patents, is also used in the far more numerous Advanced Program-to-Program Communications prod-

ucts and installations, he added.


"The real question is how much IBM plans to enforce" the patents, Kalajan added.

It was unclear whether the patent issue will affect end users who wish to develop their own APPN systems in-house but have no intentions of selling it.

One possibility is that IBM will unbundle the patents from the license, which would allow vendors to obtain just those patents they need to continue their work, Clark said. IBM has indicated that it may do this by year's end, he added.

Also raised at the conference was the question of whether IBM intends to enforce the patents on, or charge a license fee for, APPN End Node.

End node products, several of which are now on the market, can access APPN resources but cannot perform the sophisticated directory and routing functions defined by Network Node. IBM intends to clarify its position on End Node shortly, according to Peters.



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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Legent reveals plan for merging Goal products

BY GARY H. ANTHES
CW STAFF

VIENNA, Va. — Legent Corp., which recently consummated its merger with Goal Systems International, Inc., last week outlined its approach to consolidating both product lines. Users briefed by Legent said they were satisfied that their product investments would be protected.

There is little redundancy in the combined product line, which now includes 130 items. However, some widely used products in two areas — automated operations and output management — do offer similar functions (see chart). Legent said it will migrate products in those areas to unified “superset” products that offer the best features from each camp and ensure upward compatibility.

Premier Bank NA in Baton Rouge, La., was one of 15 companies that joined a user task force to help Legent map out its

strategy for developing the superset products. “I just went away skipping and dancing” after a day and a half of meetings with Legent and Goal product managers, said Sybil McDonald, an assistant vice president and business analyst at the bank.

Three years ago, Premier Bank evaluated Legent’s Bundl and Goal’s SAR/Express Delivery products for automated report distribution and gave Goal the nod. Now, McDonald said she hopes to get the best features of both product lines and then some. “They promised things that neither product had but everyone wants, like electronic notepads. The feeling I got was we’ll be better off than we are now,” she said.

Legent said that within 12 to 18 months it will bring out new

releases of Bundl and SAR/Express that contain enhancements to those features that are to survive in the superset product, which will emerge 12 to 24 months later.

The two product lines for automation of data center operations will follow a similar approach. Goal’s OPS/MVS kernel will be surrounded with the modular components of Legent’s AutoMate/MVS, such as the Relational Data Framework and the System State Manager.

Tom Cunningham, operations manager at Progressive Cos. in Mayfield Village, Ohio, said he was satisfied with

the plan for AutoMate/MVS, which he runs on two IBM 3090/600s and an Amdahl Corp. 1400. “My concern was, how were my 20,000 [user-written] AutoMate rules going to be protected? But their approach will protect our investment; in fact, it will strengthen it.”

Legent said it will also give users tools to help with file conversions and other chores necessary to move to the superset products. However, upgrading to those products will be much like installing a new release of an existing product, according to Suzanne M. Nicastro, director of product management at Legent’s \$120 million-a-year Data Center Management Group.

Greg Thomas, a senior technical analyst at Bethlehem Steel Corp. and a user of both Legent



Legent's Nicastro likens upgrades to new releases

United we stand

The superset operations automation product for the mainframe will combine the functionality of Legent’s AutoMate/MVS with the Goal OPS/MVS kernel and will include the following features:

- SQL-based data storage that provides a relational data cache for automation information.
- Multiaddress space architecture to take advantage of MVS multitasking.
- A single-message repository to store, search and browse through system messages.
- Automated resource management to manage the operational status of critical system components.

The superset PC-based product for operations automation will combine elements of Legent’s AutoMate/XC kernel with the functionality of Goal’s OCF and OPS/Relay and will have these features:

- Support for monitoring mainframe information from LANs.
- Graphical display of system activity on the PC.
- Conformance with IBM’s System View.
- LU6.2 capability for data transfer from PCs to mainframes.

The superset product for output management will combine the functionality of Legent’s Bundl with Goal’s SAR/Express kernel and will offer the following features:

- Concurrent post-JES processing for high-performance data collection.
- Pre-JES capability for real-time processing and reduced I/O to the JES spool.
- Optical disc support as an alternative to microfiche.
- Bar-code support for report tracking and statistics.
- Collection and balancing facilities for verifying reports.

Bumping heads

Product overlap between Legent and Goal

Application	Legent	Goal
	Installations (thous)	
Automation of data center console operations	Automate... 600	OPS... 550
Automation of report distribution and administration	Bundl... 150	SAR/Express... 1,200

Source: Legent Corp.

CW Chart: Michael Siggins

Hughes zeros in on PC costs

CONTINUED FROM PAGE 1

agers will take advantage of the agreement.

“It’s better to lead people by showing them benefits rather than by holding a big stick in front of them,” Berry said. “We think if the [purchasing agreement] keeps costs lower, they’ll want to use it.”

Szeto would say only that Hughes typically spends millions of dollars annually on PC hardware alone. Still, as Hughes shrinks, this could change. During the next six quarters, more than 9,000 of the company’s 60,000 employees will be laid off as it blends seven divisions into five, centralizing common functions where it can.

Hypothetically, Hughes could save at least \$1.2 million annually if it purchased 2,500 custom-built PCs under the new agreement: Custom-made PCs would cost \$3.75 million; a deal for similarly configured Compaq Computer Corp. DeskPro/1 Model 120s would cost \$4.95 million, before adding in the monitors.

Leasing will also save Hughes

money while keeping the company on the cutting edge of technology, analysts said. Leasing PCs in bulk, however, is not common, according to industry

statistics from the Computer Dealers and Lessors Association, which showed that \$1.9 billion was spent on leased PCs, workstations and terminals in

1991. Analysts said the dire economy makes buy/lease deals and efforts at partnerships more likely in the future.

“I’ve been getting a fair number of inquiries on leasing; I think that’s increasing,” said Jack Karp, a vice president at Meta Group, Inc. in Westport, Conn.

spend a lot of energy competing. They can focus on me and my needs. I see that as a definite plus.”

With expected sales this year of \$410 million, Legent is now the third-largest provider of systems management software after IBM and Computer Associates International, Inc.

Capital-constrained Hughes made leasing a major component of its new purchasing agreement because it wants to keep all PC purchases under the \$1,500 Federal Acquisition Regulation expense cap. Hughes treats the monitor, CPU and keyboard as separate items so it can spend more than \$1,500 for an entire system. Its arrangement with Micro Assistance Group (see story at left) lets it buy a 33-MHz 386DX-based box with a monitor and keyboard for less than \$1,500.

Hughes’ PC Price Evaluation subcommittee is working on a deal that will allow it to buy even 33-MHz 486DX-based PCs for less than \$1,500 from appointed resellers. But servers, high-level notebook computers and high-end Macintoshes from Apple Computer, Inc. (more than half of Hughes’ PCs are Macintoshes) cost more than \$1,500 and will ideally be leased.

Szeto said she thinks deals such as the one Hughes has just signed herald a new future for major corporations. “It would be foolhardy not to do this with all the rightsizing and downsizing going on,” she said.

Into the wild blue yonder

Hughes aggressively sought partners that were not adverse to sharing risk. The two resellers it will work with on the PC purchasing deal were the low bidders responding to Hughes’ request for proposals, said Timothy Leber, manager of customer systems support at Hughes Enterprise Information Systems.

Hughes and the two resellers created a “living” contract, which allows for substantial tweaking as the parties’ needs change.

As an example of Hughes’ daring, the only DOS-based vendor currently approved under the contract is a small Phoenix-based systems integrator, Micro Assistance Group (MAG). MAG builds IBM clones according to component specifications established by Hughes. MAG was selected because “it has the right attitude — they want to do things proactively,” Leber said.

MAG supplied only 400 PCs to Hughes in the

last year, while the company tested how the relationship would work. Hughes appears to be taking a leap of faith that MAG can continue to deliver PCs in a timely manner.

Vivian Szeto, a contract negotiator at Hughes, said negotiating the buy/lease pact with the resellers — Sun Computers, Inc. in Carson, Calif., and Infosystem Computer Center in Torrance, Calif. — was “extremely challenging,” but she said she is happy with the outcome.

The same two firms will handle leases when the agreement is signed, she said. Sun will be used primarily for the Apple Computer, Inc. Macintosh, and Infosystem will handle MAG equipment and other IBM PC-compatible boxes.

Still, Hughes is looking for a second approved source of “expense” PCs, because several groups within Hughes complained of being limited to one source.

MICHAEL FITZGERALD



August 3, 1992

TO: Modem Users
FR: Multi-Tech Systems
RE: Hayes' Recent Ad ("Tick, Tick, Tick. Boom! You're Dead")

You may have seen the recent ad from Hayes Microcomputer Products, showing a time bomb along with the headline "Tick, Tick, Tick. Boom! You're Dead." Because of our concerns about the deceptive nature of this ad and the "test kit" mentioned in the ad, we took legal action. On July 29, at our request, a Minnesota federal court judge restrained Hayes from distributing its test kit.

Having seen the ad, you might wonder what Hayes was talking about. The ad says your modem may be "fatally flawed", without explaining what the flaw is. They simply call it a "time bomb" that endangers "your data, your company and even your job." Hayes offers you a free "test kit" to "uncover the bomb", and suggests that you replace your "flawed" modem with a Hayes modem.

To clear the air a little, the issue Hayes is referring to in their ads is modem escape sequences. Escape sequences are used to switch a modem from on-line data mode into command mode, usually for the purpose of telling the modem to hang up. There are several escape methods, including timing dependent in-band escape sequences (like Hayes'), and various timing independent escape sequences (aka "TIES"), including out-of-band escape sequences using a BREAK signal. All of these escape methods are effective. However, Hayes' position is that any modem that does not use their escape method (and thereby license their patent) will be highly prone to accidental escapes, which will "paralyze the data" and cause "untold chaos". That is the "bomb".

Multi-Tech modems have been designed with quality and reliability in mind. They give you a choice between timing independent in-band and out-of-band escape sequences. We have seen no false escapes. As far as we know, neither has the industry. For that reason, we were troubled by the Hayes message that the design was a disaster.

We were even more troubled when we saw the Hayes test kit. The test kit's "Modem Escape Reliability Test Files" make a TIES modem escape "on purpose". This result is then intended to convince you that the TIES modem is prone to escaping "accidentally". Once we saw that the test was rigged, we took steps to stop Hayes from confusing the industry for their own purposes.

The Court's July 29 order recognizes that "the public has an interest in basing its purchasing decisions on accurate information about products and competitors. Multi-Tech has demonstrated that permitting Hayes to issue the test kit in conjunction with the advertisement would likely undermine that public interest." As we understand the order, the Court sought to protect both Multi-Tech and the industry from the impact of Hayes' deception.

Negative advertising is bad for everyone. In this case, it's bad for Hayes, bad for Multi-Tech, and bad for you. We regret having to run an ad like this one, but feel we have no choice but to respond. Thank you for listening.

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, Minnesota 55112
(612) 785-3500 (800) 328-9717
FAX 612-785-9874

NEWS SHORTS

Move afoot for common mail calls

The X.400 Application Program Interface Association (XAPIA) last week began recruiting vendors and messaging service providers to help develop a Common Mail Call as an "open" set of APIs. These help move electronic mail between desktop applications running on different platforms and across different mail systems and local-area networks. Replacing proprietary mail calls with common calls aims to reduce mail-enabled application development headaches.

.....

Embarc signs GE, IBM E-mail nets

Subscribers to Embarc, Motorola, Inc.'s next-generation wireless paging system, are now able to receive messages from General Electric Co. and IBM E-mail networks. The two X.400 gateways are the first of many planned with information network providers, Embarc executives said.

.....

RAID advisory board formed

Seagate Technology, Inc., Data General Corp., IBM and seven small storage companies banded together to form the RAID Advisory Board in an effort to set standard terminology to "clear up user confusion" about redundant arrays of inexpensive disks (RAID). John Hartjen, manager of mass storage marketing at DG, said users are unsure which storage needs are best met by which of the five RAID levels. The board plans to write several white papers and other educational materials during the next year. Micropolis Corp. declined to join the group, and Storage Technology Corp. said it is still undecided whether to join.

.....

CPIC to comply with X/Open

IBM told a gathering of developers last week that upcoming releases of its Common Programming Interface for Communications (CPIC) will comply with an X/Open Consortium Ltd. version of the protocol. IBM also said it would implement the Open Systems Interconnect (OSI) Common Management Information Protocol on top of its Systems Network Architecture transport protocols, rather than on OSI, according to Don Czubeck, an attendee of the conference and the president of Gen2 Ventures.

.....

RBOC to sell Cisco, ACC routers

US West's Advanced Communications Services business unit last week reportedly signed an agreement with router leader Cisco Systems, Inc. to market Cisco products alongside imminent new data services, including frame relay and Switched Multimegabit Data Service. The move follows an announcement the previous week that US West will also market inter-networking vendor Advanced Computer Communications' bridge/router line.

.....

Short takes

Unified Systems Solutions, Inc. released Network Management Translator, which is said to enable AT&T's Accumaster Integrator Network Management System to manage devices via the Simple Network Management Protocol. . . . **Gupta Technologies, Inc.** and **Hewlett-Packard Co.** agreed to jointly develop an interface between Gupta's SQLBase personal computer LAN database server and HP's AllBase/SQL relational database and TurboImage database. The interface will be based on **Microsoft Corp.**'s Open Database Connectivity API for SQL access. . . . **Apple Computer, Inc.** has named John Floisand president of Apple Pacific. . . . Apple and the National Science and Technology Board in Singapore have announced the opening of the APPISS Research Center to conduct joint technology research. Efforts will focus on new technologies that cater to the complex Asian writing systems and research on related technologies such as handwriting and speech recognition. . . . **Digital Communications Associates (DCA)** is now shipping Remote LAN Node 1.1, asynchronous remote communications software that comes bundled with a new Intelligent Client Multi Port Adapter Card from DCA and an Ethernet card from **Standard Microsystems.**

Budget remaps outsourcing plan

Considers partnership with EDS or AMR for new car reservation system

BY MARK HALPER
CW STAFF

LISLE, Ill. — Budget Rent A Car Corp. and Electronic Data Systems Corp. are discussing the development of a computerized reservation system that would supplant a similar project that until recently was to be handled by AMR Information Services, Inc.

Switching outsourcing vendors is just one of several recourses that Budget is considering now that AMR Information Services has ceased development of the Confirm reservation system, Budget Executive Vice President Kevin McShea said.

Budget's other options, McShea said, include the following:

- Continue to tap AMR Information Services, which processes both Budget and Hilton Hotels Corp. on a system called North.
 - Build a new system in-house.
- Budget had planned to cut over to the Confirm system on Sept. 30, once AMR Information Services completed development of Confirm, an integrated airline, automobile and hotel reservation system. AMR Information Services was the development partner in Information Consortium, also known as Intrico, which included users Budget, Hilton and Marriott Corp.

Budget recently abandoned its Confirm plans after technical problems surfaced amid suspi-

cions that AMR Information Services hid its development difficulties for months from consortium partners [CW, Aug. 10]. Those problems led Budget, Hilton and Marriott to abandon Intrico; they are discussing disbursement of funds and assets.

Hilton and Marriott declined to discuss their options now that Intrico and the Confirm project are dissolving.

McShea, who is a member of the Intrico board, said Budget's outsourcing contract with AMR Information Services expired in January, and the two companies have continued doing business since then under "a gentleman's agreement."

He maintained that despite Budget's "disappointment" in AMR Information Services' Confirm development efforts, Budget has not lost confidence in AMR Information Services as a raw data processing provider.

Pros and cons

If Budget were to continue on the North system, however, it would not benefit from the functionality it would have received under Confirm, which would have been state-of-the-art.

McShea praised EDS' reservation system smarts, noting that the outsourcer has acquired from clients functionality such as car rental, point-of-sale and hotel property management systems, which it has combined with

its own system. Some of that functionality has come from EDS' 1½-year-old equity/out-sourcing deal with National Car Rental System, Inc. in Minneapolis.

The Budget executive pointed out that Confirm, while it was to have had robust reservation and decision support capabilities, would not have included some of the integrated features offered by EDS, at least initially.

"There's a distinct difference between [AMR Information Services'] Confirm strategy and EDS'," McShea said. AMR Information Services "was attempting to build a new technology solution from the ground up. EDS' strategy of acquiring solutions has made them capable and quicker to market with a broader portfolio."

Meanwhile, McShea said, Budget is seeking to recoup the money it invested in the Intrico partnership, which lasted for about 3½ years. He declined to state how much Budget is seeking but claimed that AMR Information Services' alleged cover-up of technical problems is not causing Budget to seek additional compensation.

He also claimed that Budget is not seeking software code, noting that "we don't want dirty code." Sources, however, noted that some of the Confirm software modules are in good shape and are still usable.

House bill would restrict air reservation systems

CONTINUED FROM PAGE 1

overkill and said it unfairly penalizes them for building highly successful business systems. American said it had invested \$1.3 billion in Sabre through 1991 — and lost \$165 million before it turned a profit — so it is entitled to some rewards from the high-risk investment.

Robert L. Crandall, American's chairman and president, called the House legislation "a special-interest bill intended to benefit less successful CRS owners and certain airlines that didn't have the foresight to invest in computerized reservation systems."

American launched Sabre in 1976 after other airlines declined to participate in an industrywide system.

Famous as the classic example of a "strategic information system," Sabre has been especially lucrative for its owner. A 1988 government study showed that ownership of Sabre provid-

ed American with additional bookings worth \$100 million to \$200 million a year because travel agents tend to book flights on the carrier that provides the system.

The Sabre information system is so valuable that Crandall told a Society for Information Management audience last year, "If you told me I had to sell either the airline or the system, I'd probably sell the airline."

Risky business

The Sabre story illustrates the political and legal risks that companies run when they use information as a competitive weapon, according to Peter Marx, an information industry attorney in Wellesley, Mass.

However, Marx said, IS executives should not be cowed by the risks. His advice: "Charge ahead. You should be so lucky to end up in the position of Sabre."

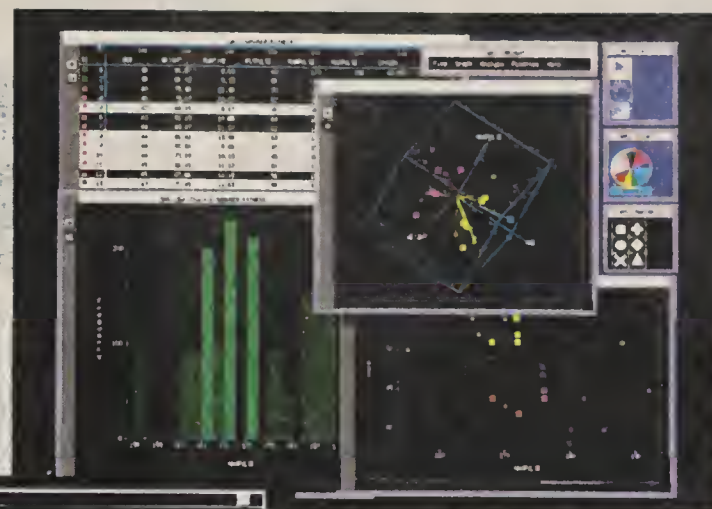
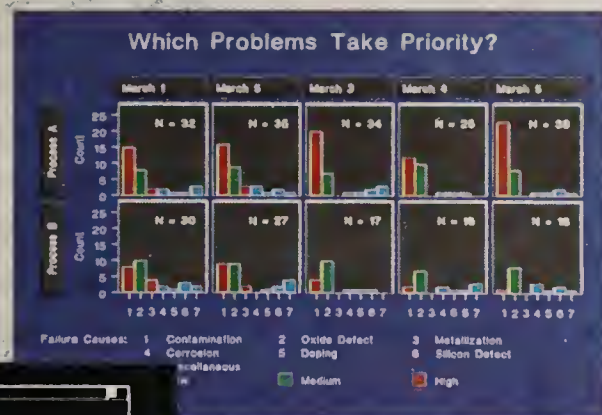
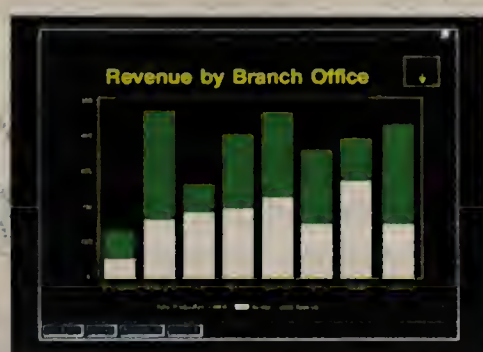
The House action is the latest

episode in a long-running anti-trust battle over Sabre and Apollo, which control more than 60% of the reservation system market. In 1984, the government outlawed system display bias, but in the last few years, American and United have repelled antitrust lawsuits filed by competitors such as Continental Airlines and Northwest Airlines.

Critics said Sabre and Apollo have an "architectural bias" that makes it slightly more difficult to look up information and book flights on nonhost carriers.

The House bill requires the elimination of architectural bias by Sept. 30, 1994. The bill also bans the reservation system vendors' practice of prohibiting travel agents from adding third-party hardware or software or using a terminal to access other reservation systems.

To make it easier for travel agents to switch vendors, the House bill limits contracts to three years and bans automatic extensions, minimum use requirements and excessive financial penalties for breaking a lease. The Transportation Department's reservation system regulations are expected to be very similar to the House bill.



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EDS takes over retailer's app development

BY MARK HALPER
CW STAFF

CHICAGO — Montgomery Ward & Co. last week handed over its application development to Electronic Data Systems Corp. in an estimated \$100 million, multiyear deal that will land the retailer's developers on the EDS payroll.

The announcement came on the eve of

an anticipated disclosure by EDS that it has signed a five-year licensing pact with Texas Instruments, Inc. for TI's Information Engineering Facility (IEF) integrated computer-aided software engineering development tool, a move that would raise the possibility that EDS would implement IEF at Montgomery Ward.

According to one source, EDS' Montgomery Ward deal grew out of the retailer's interest in developing and implementing a new point-of-sale (POS) system. Neither company would confirm that that was the driving force behind the agreement, which calls for EDS to take over across-the-board development in POS, merchan-

dising, distribution, financial, electronic data interchange, database and other operations.

Gregory Granello, vice president of sales and marketing at EDS' Commercial Services business unit, said negotiations also touched on the possibility of EDS' taking over data center operations but that Montgomery Ward decided to keep that function in-house.

"For the time being, we're not doing the data center," Granello said, declining to elaborate on whether EDS plans to continue to pursue a data center contract with the retailer. Outsourcers such as EDS often use development or integra-



tion jobs as stepping-stones to data center assignments.

While EDS has won development projects with other large retailers, including Montgomery Ward rival Kmart Corp., last week's contract marks the first time EDS has taken over entire development operations for a retailer that continues to run its own data center, according to Granello.

Earlier this year, EDS won an estimated \$160 million data center and distributed computing job with Salt Lake City-based Smith Food & Drug Centers, Inc. That contract called for EDS to take over application development [CW, May 25].

Neither Granello nor a Montgomery Ward spokeswoman would divulge the value or duration of the Montgomery Ward pact.

The Montgomery Ward spokeswoman said EDS has offered jobs to all of Montgomery Ward's development employees, who have two weeks to make a decision. About 150 employees are involved, she said.

The spokeswoman said the retailer weighed proposals from other integrators that she declined to identify. She said the company determined that EDS could develop programs faster than Montgomery Ward's own staff had.

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Borland readies product rollouts

BY CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. is scheduled to announce a fleet of development tools this week — among them upgrades to ObjectVision and Borland C++.

ObjectVision Pro Version 2.1 (\$495) includes an enhanced version of the ObjectVision graphical development tool with Paradox 3.5 and 4.0 file compatibility, a faster Paradox Engine and support for Paradox Memo fields and Binary Large Objects (Blob). This is bundled with Turbo C++ for Windows 3.1, SQL Connection, a multimedia tool kit and a graphical report writer.

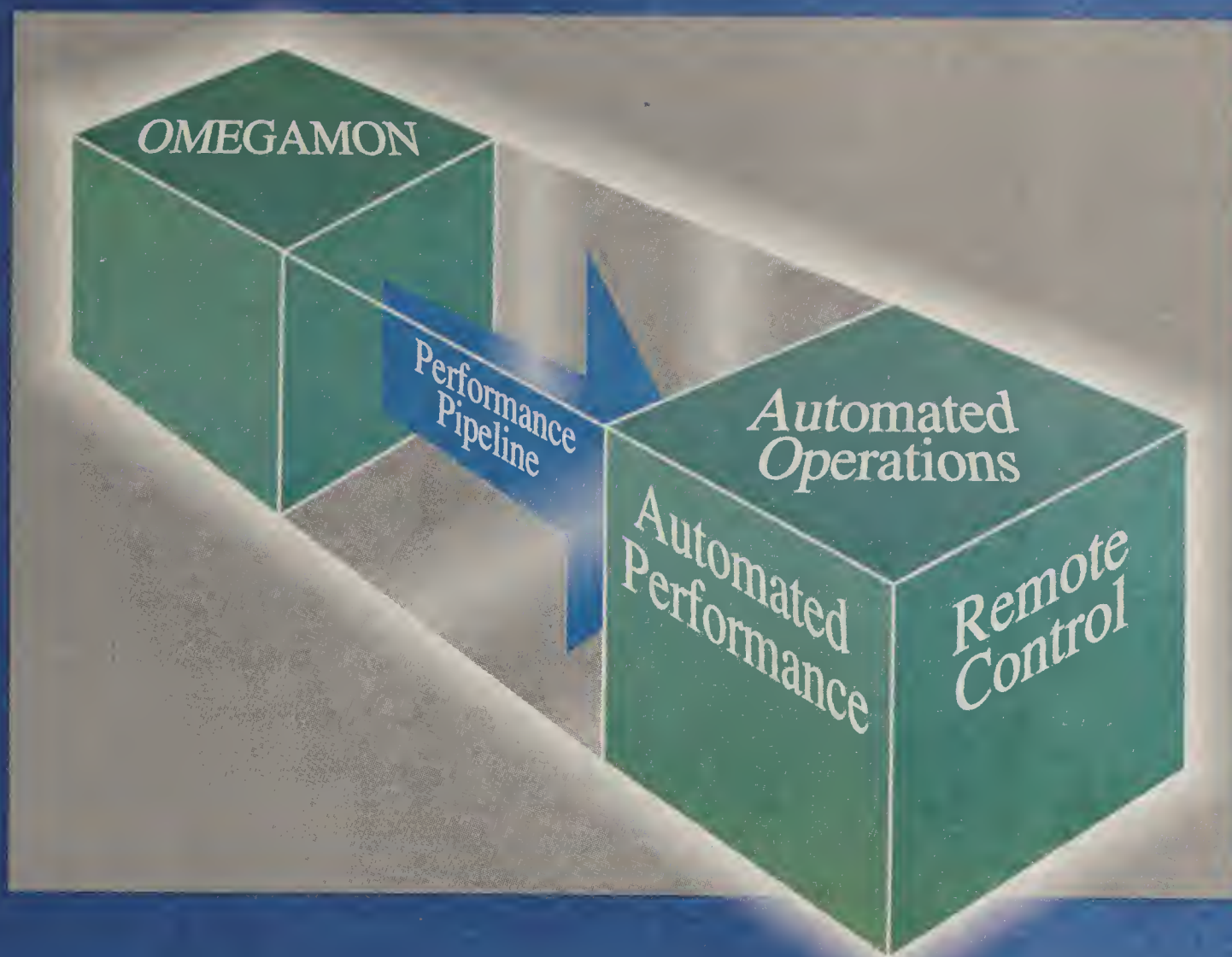
Blob support is also included in the Borland Paradox Engine Version 3.0. An object-oriented access layer has been added for use by C++ and object-oriented Pascal programmers. The \$299.95 package allows Paradox programmers to integrate external applications with Paradox data.

Borland will also ship Version 3.1 of the Brief programmer's text editor. Both DOS and OS/2 versions will be included in one package for a list price of \$249.95, the company said.

In addition, the company has a pair of compact disc/read-only memory (CD-ROM) offerings, including Borland C++ and Application Frameworks Version 3.1 for CD-ROM (\$19.95 to current Borland C++ and Application Frameworks users) and the Borland Language KnowledgeBase, a database of tips, bug reports and technical answers about Borland products.

Another disc, the Borland Applications KnowledgeBase, is also available. Each disc has a list price of \$249.95. A yearly subscription with quarterly CD-ROM releases is available for \$495.

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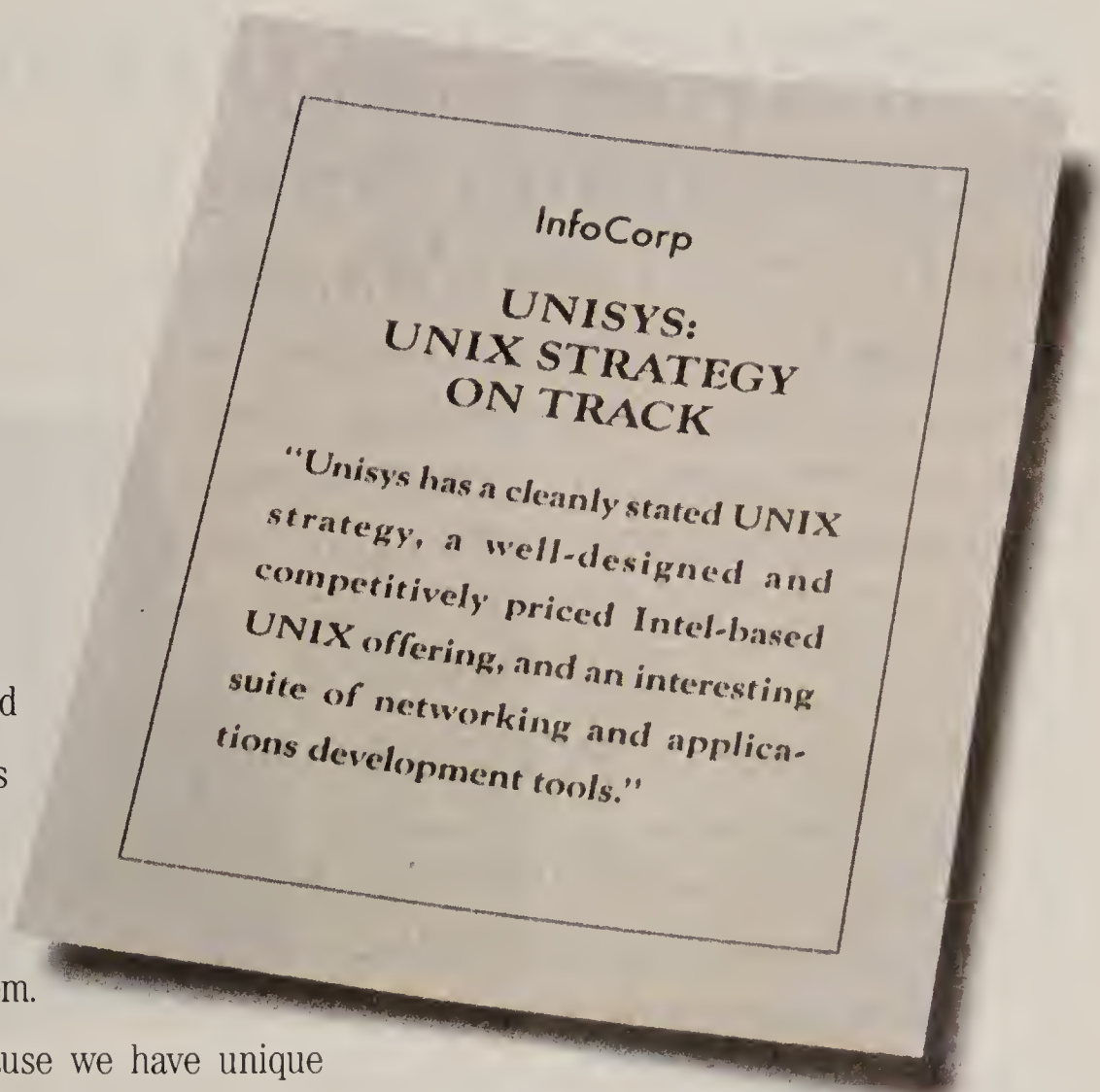
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KnowledgeWare's profits fall

User disenchantment with CASE cited as major setback

BY KIM S. NASH
CW STAFF

ATLANTA — KnowledgeWare, Inc. last week reported a 98% nosedive in profits for fiscal year 1992 — to \$260,000 — from the comparable period last year. A first-quarter loss, coupled with expenses related to getting acquired products to run with its development workbench, was the primary drag on earnings.

The company would have reported a loss for both the year and the quarter — in which it earned \$2.3 million — were it

not for income it received from a three-year, \$25 million product sale to IBM that began rolling during 1992's fourth quarter.

The computer-aided software engineering (CASE) tool maker — which is also an IBM AD/Cycle partner — booked three consecutive profitable quarters after reporting a loss for first-quarter 1992. Money from the IBM deal totaled \$7 million for the fourth quarter and \$9.4 million for the year.

The year was a tough one for the company. General user disenchantment with

CASE hurt KnowledgeWare and other application development vendors, including Easel Corp., which recently reported a quarterly loss of \$585,000.

KnowledgeWare also laid out an undisclosed sum for tweaking products from recently acquired companies and establishing a new consulting services operation.

Looking forward, KnowledgeWare plans to emphasize CASE consulting services to help users get started with the Application Development Workbench (ADW) in addition to simply selling the CASE workbench, according to Don Addington, chief operating officer.

Ed Acly, an analyst at International Data Corp., noted that services are the way of the CASE industry as a whole. Half

Profitable — barely

KnowledgeWare's 1992 year-end profits do not even equal 2% of its '91 profits

	Q4 '91	Fiscal '91
Sales	\$40.30M*	\$124.30M
Profits	\$5.30M	\$15.30M
	Q4 '92	Fiscal '92
Sales	\$34.00M	\$115.10M
Profits	\$2.30M	\$0.26M

*Record high

CW Chart: Michael Siggins

of rival Texas Instruments, Inc.'s estimated \$125 million in CASE-related revenue for 1991 came from services, he said.

Addington added that one of the "key" areas of focus for the company is supplying "best-of-breed CASE component tools and services" to users. This seems to be a shift from KnowledgeWare's historical adamant, integrated-CASE stance.

Acly agreed. Citing KnowledgeWare's widely criticized "weak" code generator as a "tenuous at best" link between ADW's upper and lower CASE pieces, Acly said, "they've never had a real integrated product line anyway."

The company has promised to ship an enhanced version of ADW, its flagship integrated CASE workbench, by year's end. Enhancement plans for ADW Release 2.7 include rapid application development features as well as the roots of support for Unix-based development.

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Banyan Vines to include OSI suite

BY MICHELE DOSTERT
CW STAFF

WESTBORO, Mass. — Banyan Systems, Inc. last week revealed that its forthcoming Vines network operating system for The Santa Cruz Operation's SCO Unix will include a suite of Open Systems Interconnect (OSI) products.


Vines for SCO Unix will ship next month, Banyan said; the OSI products, which work with SCO-based Vines through gateways, are scheduled to ship in March.

Banyan is licensing the new product set from Retix Corp., an OSI supplier in Santa Monica, Calif. Retix and Banyan also agreed to cooperate on support issues for Banyan's OSI customer base.

Banyan's new OSI product set will comply with the Government Open Systems Interconnect Profile (GOSIP) Versions 1 and 2. The four server-based software options include Virtual Terminal; File Transfer, Access and Management; Local-Area Network Transport; and Wide-Area Network Transport. The options run on the SCO Unix operating system, which is compliant with the government-endorsed Posix standard.

"We are very pleased to see Banyan [providing] OSI integrations and GOSIP support in a form that will simplify our GOSIP migration plan," said Richard Campbell, chief of research and development at Federal Deposit Insurance Corp.'s MIS branch.

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Coral Networks ships fledgling broadband switch

BY JOANIE M. WEXLER
CW STAFF

MARLBORO, Mass. — After 2½ years of snafu-ridden development, a revolving management team and near-fatal financing problems, internetworking start-up Coral Networks, Inc. last week shuttled a bare-bones version of its Broadband Enterprise Switch out the door.

The switch gained attention when it was announced in January 1991 for its potential as a do-it-all communications device that blends the redundancy and functionality of telecommunications equipment with local internetworking perfor-

mance. However, its late arrival and neophyte status mean that one major Coral challenge will be to keep food on the table while filling in the gaps in the device's original promise, some observers said.

The initial version — the CX1600 — routes two protocols, Internet Protocol and Novell, Inc.'s IPX. The CX1600 also emphasizes slow-to-be-accepted Fiber Distributed Data Interface (FDDI) networking, and some of its attractive features are likely to be years away.

For example, Convex Computer Corp., which has been involved in beta testing the product "since Day 1," is looking to benefit three to four years out, said Coyne

Gibson, manager of information technology at the Richardson, Texas, firm.

This is when Gibson said he expects the switch to combine the functions of his Cisco Systems, Inc. routers and Stratacom, Inc. T1 multiplexers.

Gibson noted that Convex has a long-term goal to build a "universal transport network" that doesn't differentiate between different types of data packets and voice. "This is a box that will ultimately do that job," he said.

Not all users can wait. For example, a large software company that also evaluated the CX1600 said that although it found the product innovative, the functions it

needed right away, such as Ethernet-to-FDDI bridging, were not there.

In addition, "Asynchronous Transfer Mode [ATM] is coming up real fast," said Nick Lippis, president of Strategic Networking, Inc. in Rockland, Mass. ATM is a standards-based cell-switching network technology hoped to one day blend local- and wide-area networks. Coral has not announced its ATM strategy.

Coral also has to overcome a muddled history. Its switch was originally positioned as a communications device containing "everything known to the internetworking community," said Coral President John Thibault, who acknowledged some initial positioning problems.

Thibault also conceded that one week after the product was announced, the firm discovered a six-month development delay. The company then recruited Thibault from Codex Corp. in June 1991 as the company's third chief executive in its two-year history, whereupon one of Coral's two lead investors, TA Associates, left \$6 million on the table. In the sluggish economy, Coral was forced to scurry for fresh financing, which it found in the eleventh hour from Sevin Rosen Funds and Gibraltar Trust [CW, Jan. 6].

Today, Coral's switch is positioned as "the Tandem or Stratus" of the networking community because all of its components are redundant, Thibault explained. However, its centralized architecture, in which multiple networks share one processor, "means there is some level of single point of failure" associated with it, Lippis observed.

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There has been little known testing of the CX1600's performance, one of its touted strengths.

Beta-test site Convex Computer reported routing at "near wire speeds" and bridging "at wire speeds, no problem," said Coyne Gibson, manager of information technology.

In addition, Scott Bradner, a Harvard University consultant who heads up independent internetworking benchmark testing, attested to Coral claims that the CX1600 fills 100% of available LAN bandwidth when performing FDDI-to-FDDI bridging at all packet sizes.

Bradner's benchmark tests of Internet Protocol routing, however, show a throughput of just 25,000 packets per second out of a possible 180,000. Given these numbers, Bradner said, Coral's claims of guaranteed 100% WAN bandwidth use "would seem overenthusiastic."

No WAN testing of Coral equipment has been done at Harvard or Convex, according to Bradner and Gibson.

Coral President John Thibault said the firm's WAN throughput claims are based on T1 and frame-relay throughput tests at beta-test sites, although he declined to name them.

JOANIE M. WEXLER

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ADVANCED TECHNOLOGY

DRAM advances pave way for new adventures

BY MICHAEL FITZGERALD
CW STAFF

Dynamic random-access memory leads a split life in the computer world. On the one hand, it acts as the cockroach of electronics: It comes in a small, hard shell, has lots of legs, lacks glamour and is everywhere. On the other hand, it's like the human brain: Systems could not live without it, and with it, people can generate some very exciting things.

This dual nature creates a paradox where some can say "memory chips are not exciting" — as Sherry Garber, an analyst at In-Stat Research, Inc. in Phoenix, concedes — yet they follow the business of memory chips with great interest.

Garber, for instance, can spout information on current happenings in the DRAM market as though it had the drama of The Battle of Midway. These issues include things like the move to 3.3V chips in place of today's 5V chips or a current hot button in DRAM development, the coming of synchronous DRAM. This kind of DRAM will run at the same speed as the system processor. One reason DRAM is cheap and widespread is that it runs slower than static RAM.

Face-off coming

Advanced against synchronous DRAM, according to Garber, is the new memory architecture design proffered by Rambus, which will also speed up DRAM performance. Rambus has licensed its technology to Mitsubishi, Fujitsu Ltd., NEC Corp. and Toshiba Corp., and these companies will face off with those pursuing synchronous DRAM designs.

No matter which technology wins,

Garber said, "it all means faster performance of DRAM."

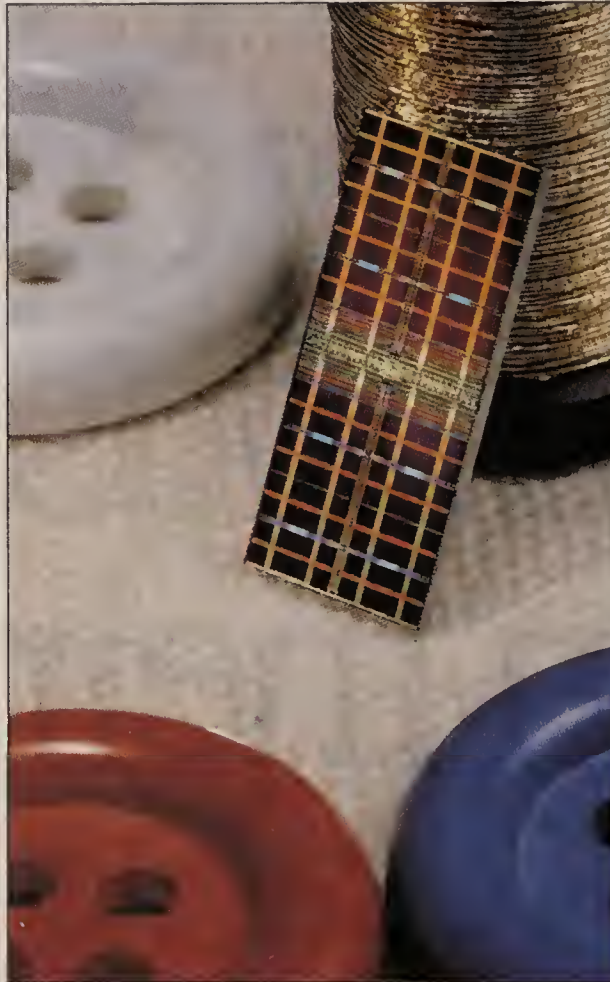
The current state of the art is the 16M-bit DRAM, shipping this year. DRAMs typically have a three-year development, so by 1995, the 64M-bit DRAMs currently under development should ship and become the dominant mode of RAM inside computers. By 1998, 256M-bit DRAMs will appear and ramp up to an era of dominance.

"When you get [to 256M-bit DRAMs], with that kind of capacity you're talking about maybe some new realms, and applications like HDTV could really benefit from cheap memory," says Drew Peck, an analyst at Donaldson, Lufkin & Jenrette, Inc. in New York. "So consumer electronics could be the big beneficiary of them. Who knows what kind of technical applications we could see for the consumer as they become available?"

As a system brain, DRAMs hold the entire application program and some subroutines for access by the processor, and they hold all the data that will be processed. So when a program such as IBM's OS/2 comes along and needs 8M bytes of RAM just to run effectively, users have to start looking for a lot more RAM just to run a program.

Ordinarily, a system would like to pull in all of, say, a 30M-byte database to run a search. But without enough space on the DRAM, data must be "swapped" in and out from where it is stored, a chunk at a time, until the entire database has

been searched. While hard drives operate in milliseconds, this still takes time. So a system with a 256M-bit DRAM could store 32M bytes of programs or data. That is more than enough room on a single chip for OS/2 and several applications.



Thomas Way

Smaller than a button, a DRAM chip can open doors of opportunity for advanced applications

A 256M-bit DRAM, then, "basically represents the dream of every software developer—a huge, unbounded linear memory array," said Michael P. Florio, vice president of marketing at

Arbor Software, Inc. in Santa Clara, Calif., maker of Sbase, which acts as a networked spreadsheet analysis tool. "I think it will contribute significantly to the evolution of software."

Florio said the huge linear address spaces would allow programs to be written where the whole data set is resident in memory, which will improve performance by orders of magnitude.

Advanced applications

Much higher capacity DRAMs could well yield the memory to easily run highly sophisticated applications that include full-motion video and voice, which would make the use of these applications nearly commonplace.

"I don't think we'll reach significant technical roadblocks, but the finances will present major hurdles," said Douglas Grose, senior location manager at IBM in Burlington, Vt. "We're starting to see it today with 256M-bit development. The issues with purity of materials and retooling equipment require ever higher amounts of dollars to be invested."

Hence the recent move by Toshiba to add its name to IBM's joint venture with Siemens to build the future of DRAMs, capable of holding 256M bytes of data.

At the time, Michael Attardo, general manager of IBM's technology products line of business, said having the three participate in development will cushion

the blow of a \$1 billion development cost and spur them to reaching market first with the new technology, the key to making significant money.

Breaking the copper-based backplane bottleneck

BY ELISABETH HORWITT
CW STAFF

IBM, Honeywell, Inc., General Electric Co. and AT&T have come together in an alliance to bring the broad bandwidth of fiber to multiprocessor computers and next-generation telecommunications switches.

The object of the Optoelectronic Technology Consortium is to "break the bottleneck" of the copper-based backplanes in use in multiprocessor systems that have a top throughput of 100M to 200M bit/sec., an AT&T spokeswoman said.

The potential benefit to end users of the project is "better information processing equipment at a reasonable price" on the computer side and "a telecommunications switch capable of doing enhanced broadband services at a lower cost," said Phil Antho-

ny, head of the optoelectronic devices department at AT&T Bell Laboratories.

The consortium hopes to have technology ready to be implemented in commercial systems by the end of the 30-month project, he added. Users can expect to see products about two years after that, Anthony said.

The first phase of the project is to develop technology to replace the current, copper-based architectures, "when you need a higher speed between boards and chips," Anthony said.

The project was organized to encourage vendors to come up with system architectures that can take advantage of the higher bandwidth backplanes, Anthony said.

Right now, for example, system architects must put a memory cache directly onto the microprocessor chip because the backplane will not sup-

port high enough speeds between chip and cache, he added.

Fiber-based backplanes are particularly needed in "environments where multiple processors are sharing data rapidly among themselves in order to coordinate on an overall task," said John Crow, manager of network prototyping at IBM's T. J. Watson Research Center.

The project represents the first major effort to develop advanced switching technology that can be used by either computers or high-speed telecommunications switches, Anthony said. "Traditionally, those two areas are developed entirely separately, but they need not be. Both use computers, circuit boards and silicon [integrated circuits]."

In addition, the project will work to develop high-speed links for military applications such as signal processing and image detection.

By having four major vendors work together on the same advanced technology, the project aims both to accelerate development and save money by eliminating the "reinventing the wheel" syndrome across the industry, project spokespeople said.

The consortium will share the results of its work with a user group that includes the members of the consortium and leading computer firms, semiconductor manufacturers and government agencies.

The project aims to develop advanced fiber-optic electronic components and demonstrate data transfer through 32 parallel, 500M bit/sec. lines. Four of those 16G bit/sec. lines will then be combined in parallel to achieve 64G bit/sec. transmission, AT&T said.

The project is backed by \$8 million from the Defense Advanced Research Projects Agency.



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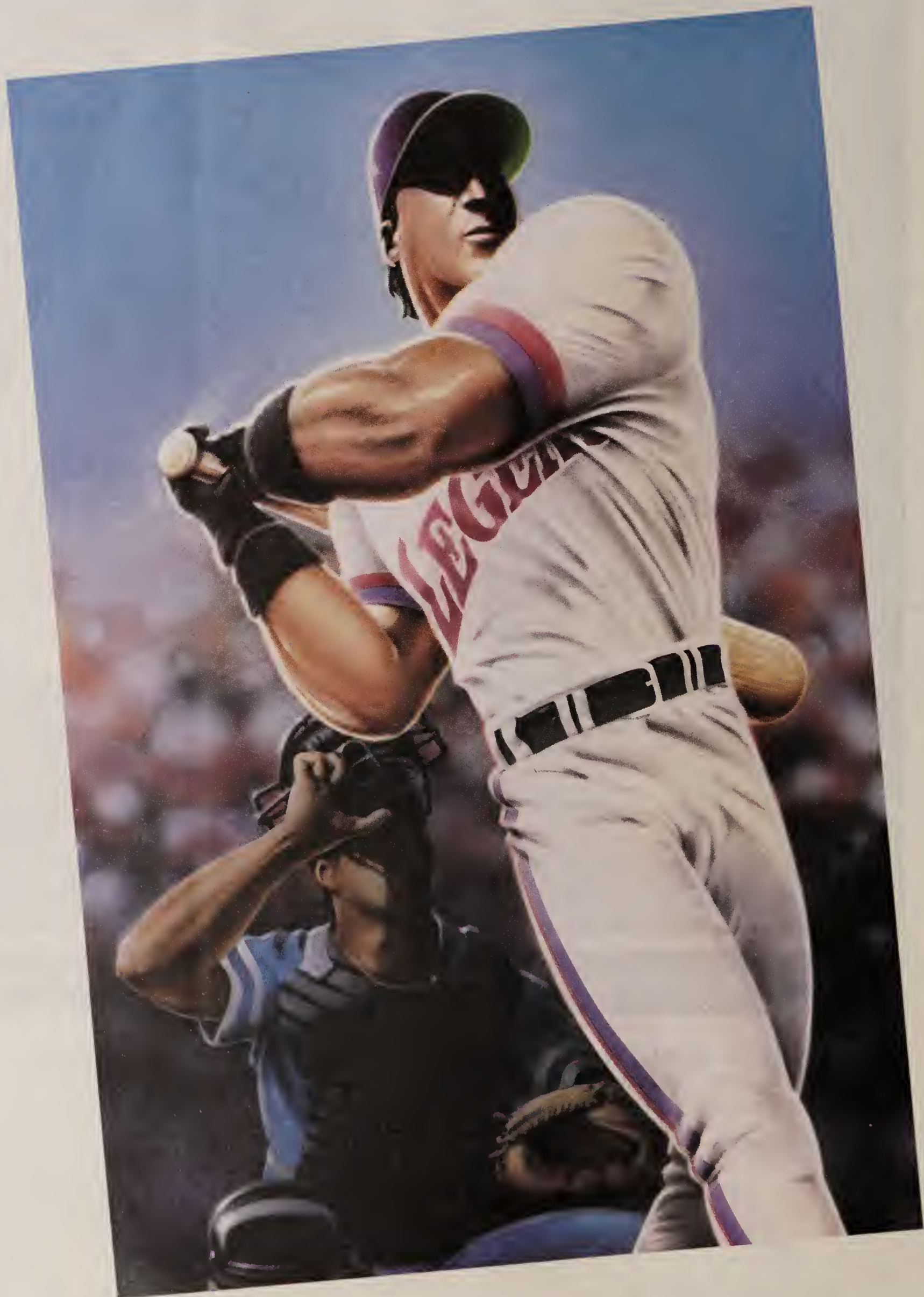
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EDITORIAL

Sour gripes



You have to write it off as just more dirty politics in this campaign season. One contender puts his best foot forward, touting all the benefits of some program. Then the other contender rises up to throw water onto those claims, disputing and mocking them.

Clinton vs. Bush? Not!

This is Microsoft vs. IBM. Each is campaigning hard for the hearts and minds of corporate users, and the issue is the desktop operating environment.

Last week's announcement by IBM that it has shipped the millionth copy of OS/2 unleashed a flood of sound bites designed to counter IBM's horn tooting and, if nothing else, demonstrated that Microsoft is taking the OS/2 threat seriously.

However, there are those who are starting to more carefully scrutinize Microsoft's actions and words, public and otherwise, with an increasingly wary eye and wondering whether the company is getting too big for its britches (see story page 33).

I'm starting to hear many of the same kinds of barbs and accusations directed at Microsoft that used to fly at another industry leader not so long ago — and that, ironically, was IBM.

Many of the IBM bashers of yesterday were simply jealous of the tremendous leverage IBM had built for itself, and there's no question that many of Microsoft's detractors are just that — green with envy. But in this era of partnerships and alliances, many of Microsoft's friends are talking a lot behind its back.

Recently I met with one such partner, who summed up much of the feeling out there by saying, "We have to work closely with Microsoft, but I truly wish I didn't have to." Fear or jealousy? Who knows. When you've got the likes of DEC hustling to align its company-saving Alpha chip technology with Windows NT, it's clear Microsoft has some big friends.

But, even the industry pundits are starting to pick sides in the campaign. One well-known columnist, charging gross interference by Microsoft in the editorial process, quit *PC Week* and *PC Magazine* in a highly publicized furor. Another newsletter pundit in an "open letter to Bill Gates" called on Microsoft to be a better corporate citizen, citing a growing sense of resentment toward the company by other firms.

One IS director with a multimillion dollar budget told me he tried to engage Microsoft's help in setting a downsizing course away from his shop's IBM mainframes. He didn't get far. In his words, "I got the feeling Microsoft didn't think I was big enough for them."

So while the slings and arrows launched by one's competitors and pundits might not amount to diddly, the world's biggest software company might want to look beyond its well-deserved success and listen carefully to the rumblings starting to make their way to the surface.

Bill Laberis

Bill Laberis, Editor in chief



LETTERS TO THE EDITOR

Programmers: Step into users' shoes

Why would anyone gripe about Bob Frankston's opinions in his article, "Programming no longer enough?" [CW, July 27]. He is absolutely right.

The legal community is searching for ways to improve individual client relations and to lower fees via automation as a way to stem the deteriorating public view of the profession in general.

Some firms have even developed expert systems for document assembly for clients to use. Programmers everywhere should take heed and learn to step into the users' shoes before thinking about the first line of code.

Users are starting to like the democratization of information technology. Companies throughout the world are scrapping mainframes in favor of personal computer networks.

Just as users will no longer crawl to the glass-walled temple of the mainframe gods praying "Please, oh please, may I have my reports now," one day they will no longer hire a programmer who doesn't also know the user's job inside and out.

Frankston's comparison of programmers and lawyers is very perceptive. I am a lawyer now, but I spent 10 years in information systems before going to law school. I am currently employed as the IS director at a major law firm.

Programmers, consultants and other IS types must keep in mind that they are support for their "clients" and not the stars of the show.

Matthew J. Ahearn
Roseland, N.J.

Tribute to Unix, not MPE portability

This is regarding "Cheerio to Unix, cereal giant says" [CW, July 20]. You were quite correct, if a little too whimsical, when you reported that General Mills "tried Unix, but it did not inhale."

However, you drew the wrong conclusion from the brief porting period required to move the warehousing software from HP/UX to MPE/IX. This success is a testament not to MPE portability but to Unix portability, particularly the portability of Unix-hosted applications.

The story also has "corporate politics" written all over it. One division takes the initiative for a new technical computing base using Unix. Fol-

lowing normal Unix operating procedure, it relies on its software vendor for software maintenance. Before the project even has time to take off, centralized corporate IS undercuts it and gets it canceled.

In the interim, it gets to pay more for a proprietary platform, becomes more dependent on its platform vendor and cuts itself off from the main venue for innovation in multiuser systems—the Unix environment.

All in all, this whole exercise seems to be a perfect demonstration of how not to direct your computing infrastructure.

Andrew D. Wolfe Jr.
Salem, Mass.

Layoffs not a wise alternative for DEC

Regarding "No time to lose" [CW, July 27]: I can't believe how easily people come to the conclusion that DEC needs to lay off 20,000 employees in order to regain its cost structure.

First of all, DEC had massive layoffs last year and so far, that doesn't seem to have helped much at all. I work at a company that is completely a DEC shop, and we have a great deal of faith in the products, services and solutions that DEC provides.

The reason for this is because I know of no other company that offers so many good products and couples them with excellent service and support. DEC has always been a company that does many things and does them well.

What has made DEC a success is its ability to commit re-

sources to new products and solutions without sacrificing quality of sales, service and support.

How is this accomplished? People! Could DEC do as well in sales, service and support without 20,000 employees?

Perhaps, but I seriously doubt it.

Eric Mink
Bethel, Conn.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

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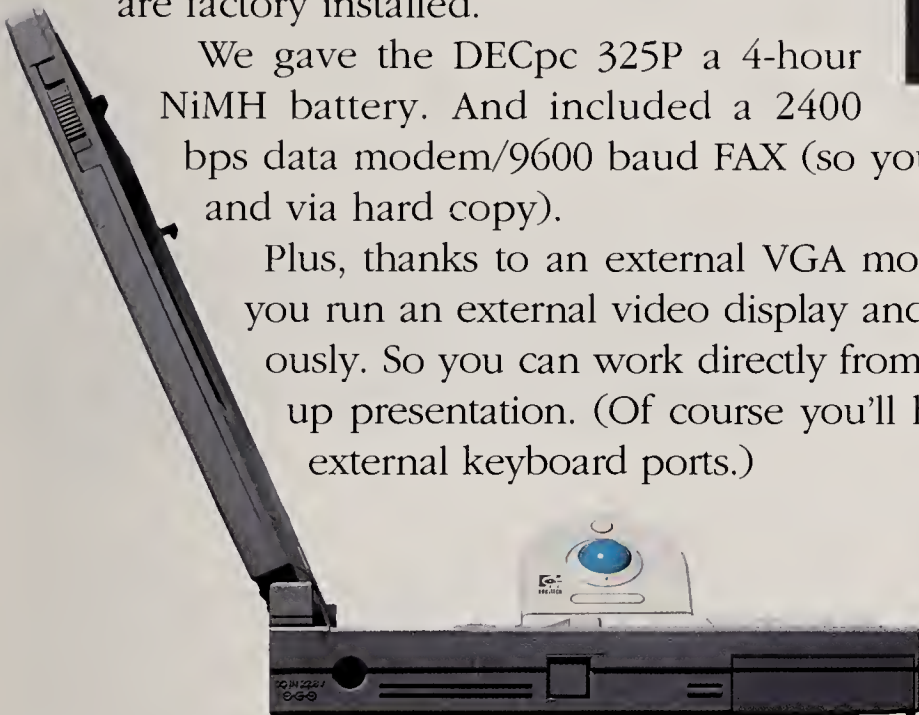
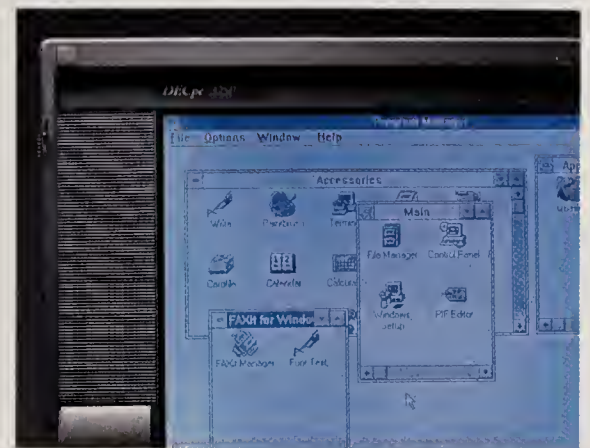
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Storage:	3.5" 1.44MB Floppy, 80MB IDE Hard Disk	Upgrade to: 120MB IDE Hard Disk
Display:	10" Triple Super Twist Backlit VGA LCD	External 14" VGA Color Monitor
Keyboard:	84-key with inverted T cursor keys	Extended 101-key Industry Standard
Pointing Device:	Built-in Trackball Logitech TrackMan Portable	
Communication:	Serial, parallel port	9600 baud FAX Modem Pocket Ethernet
Battery:	4-hour NiMH	Extra Battery Pack
Software:	MS-DOS 5.0, Windows 3.1, QA Plus Diagnostics, Choice of Lotus Software	
Carrying Case:	Black Nylon	Black Leather
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Carrying Case:	Black Nylon	Black Leather
Adapter:	AC	Car Adapter ALSO: Expansion Chassis, Portable Printer, FAX Modem, External 14", VGA, Color Monitor, External 101-key Industry Standard

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Envelope Handling Sizes:	Standard office envelopes
	Maximum width: 9.5", Maximum length: 4.3"
Paper Thickness:	19-24 lbs. (70-90 g/m2)
	Up to 36 lbs. manual feed
Print Modes:	Portrait and landscape
Optional Memory Upgrade Cards:	256KB
Resident Fonts:	Courier, Courier Landscape, Times Nordic (Times Roman)
	Proportional spacing, Letter Gothic
Cartridge Slots:	One (for font or emulation cartridges or RAM cards)

DECjet 1000 Order No.: FR-LJ16P-AA Price: \$329

DECjet 2000: Handles larger print runs with speed and reliability.



Print Technology:	Bubble ink-jet with 50-nozzle printhead
Printer Speed:	Up to 360 characters per second
Print Resolution:	300 x 300 dots per inch
Paper Handling Sizes:	8.5" x 11"; 8.5" x 10.5"; 8.5" x 14"
Envelope Handling Sizes:	Standard office envelopes
	Maximum width: 9.5", Maximum length: 4.3"
Paper Thickness:	19-24 lbs. (70-90 g/m2) Up to 36 lb. manual feed
Print Modes:	Portrait and landscape
Optional Memory Upgrade Cards:	256KB
Resident Fonts:	Courier, Courier Landscape, Times Nordic (Times Roman)
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Why successful companies fail

Hint: Customers won't stay for long when their requests aren't heeded

JOHN J. CULLINANE



My company almost went belly-up twice, once when it was 2 years old and again when it was 20 — ironically, I would discover, for the same reason.

Both times, the company had fallen into the classic technical trap of building software it felt customers ought to like instead of what our customers wanted to buy.

Our first survival challenge — we were down to \$500 in the bank — required cutting back from nine employees to five and committing to finally providing those product features that customers had been asking for all along.

The close call of our early days impressed upon me the importance of being customer-driven. It also taught me that this direction has to come from the top of the organization.

Advocates

Few companies have a Chief Customer Advocate, but every company should. In my experience, it's very easy for a company, particularly a

growing, successful one, to get out of sync with its customers.

CEOs are the logical choice to fill the post of Chief Customer Advocate. No one with less clout can do the job because in technical organizations, trying to match what your customers want to buy with what your people can or want to develop can be a "tractor pull."

Only the CEO has the power to force a match of customer re-

quirements with development resources and strategies. Only the CEO has the power to go around the company's technical organization to meet customer requirements — through third-party agreements if necessary. Only the CEO can effectively shoot someone's favorite product that has outlived its usefulness.

Operating on the basis of what customers want is not something that ever truly becomes second nature for a company. Ironically, I believed that being customer-driven was immersed in our corporate culture as a result of our first, near-fatal experience. I thought it could never happen to us again. Then it did.

What happened was that in handing over management of the company, I unintentionally left customers without their traditional advocate.

For a few years, the company had coasted along on momentum. Then it ran into serious trouble. Bringing in new management only made things worse. As in the early days, it was hurtling down the road to bankruptcy.

Reluctantly, if only to protect my own interests, I had to step in

and reclaim the company.

The more I dug into the situation, the more painfully obvious it became that we had fallen into the old we-know-what's-best-for-our-customers trap again. In a changing market, customers and prospects wanted open systems architecture. Instead, we were giving them proprietary technology, which no one wanted.

NO ONE WITH less clout than a CEO can match what your customers want with what your people develop.

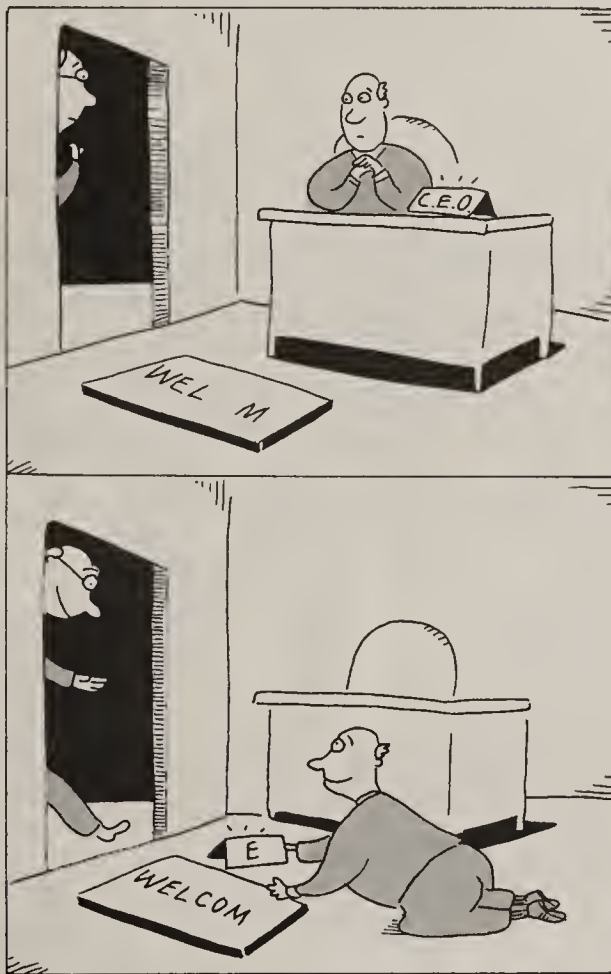
ed, regardless of how good it was.

At the time, it was almost too late to do anything. Nevertheless, we moved fast, cut costs and re-established our focus on the customer exactly as we had done during our first crisis.

Making it happen was a battle, but we started to make money again, making possible a \$400 million merger with Computer Associates. Believe me, this was infinitely superior to going bankrupt.

Having a strong customer advocate at the top can work wonders for a business. I know. I've seen the difference close up . . . twice.

Cullinane is founding chairman of Cullinet Software, Inc. and the Massachusetts Computer Software Council. His book, *The Entrepreneur's Survival Guide: 101 Tips for Managing in Good Times and Bad*, will be published by BusinessOne Irwin next month.



M.E. Cohen

Microsoft blows smoke, just like the old IBM

GARRY N. RAY



Many of you remember the old IBM. Before a federal judge said it shouldn't do such things, the company would fearlessly preannounce its "product plans" months, years or decades into the future, impeding or killing competitors who had real products to sell.

IBM's masterful use of fear, uncertainty and doubt (FUD) as a marketing tactic may seem long ago and far away, but you can get a sense of the way things used to be by listening to Microsoft. Like the IBM of old, Microsoft has the technical talent and product inventory needed to sustain sales and keep customers happy. But the Redmond, Wash., cash machine also churns out a

prolific body of myth, mystery and doubletalk.

• **Example A:** The Microsoft dream makers have lately been maligning the long-term prospects of Lotus Development Corp.'s Notes workgroup software.

Saying that the forthcoming (always forthcoming) Windows for Workgroups will include peer-to-peer networking and embedded facilities for E-mail and that it will interact with a vaguely referenced object-oriented database, Microsoft salespeople have been hinting, quite nakedly, that Lotus' Notes is an obsolete product on the fast-track to the dumpster.

Ignore the facts

Never mind that Notes works and has real, live customers. Never mind that Microsoft doesn't explain how its three

nonexistent technologies have anything to do with Notes, let alone with each other.

Bottom line: FUD. Connect technologies that aren't related. Imply but don't promise. Criticize, but don't say why. Keep everyone guessing.

• **Example B:** During the recent rollout of Microsoft's long-rumored Windows NT, the company said that nearly 100 developers had announced more than 150 application development tools. An IBM spokeswoman complained to me that those numbers are "cooked" because they include "unfair" categories such as program editors and utilities. IBM, she said, does not list such programs among the 138 OS/2 2.0 development tools it says will be shipped by year's end. Sounds like the student teaching the master.

Bottom Line: FUD. Throw numbers at customers — the bigger, the better. Hope that no one asks what the numbers mean. If they do, offer more numbers, and explain them in excruciating, mind-numbing detail.

• **Example C:** Has anyone been

keeping track of Microsoft's Grand Plans for the future of computing? It is becoming a lengthy list, and Microsoft watchers often pass the hours making spurious connections between one model and another, filling in the blanks. Customers, lacking more solid information, listen to them.

Bottom Line: FUD. Provide schematic models that imply a strong vision of the future. Don't fill in the details. Keep the customers guessing.

Good old days

In a happier time, when the milkman delivered to your door and gas jockeys wiped your windshield, the customer was always right. But times have changed.

Now the model for vendor behavior is to baffle, befuddle and scare the customer with vague warnings and unsettling "future plans." The theory seems to be that a confused customer is a compliant customer.

Maybe.

Ray is a *Computerworld* senior editor, application development.

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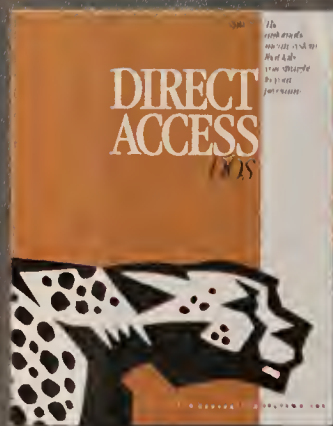
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SECURITY CHECK

James Daly

The newest virus threat



The major buzz in the computer security community continues to be the Virus Creation Laboratory (VCL), a nasty new authoring program that began popping up on bulletin boards last month and one that could dramatically change the nature of virus fighting.

Designed by a hacker called Nowhere Man, the VCL makes virus writing a snap by including a development environment written in Borland C++, well-written documentation and a user-friendly environment that offers pull-down windows.

VCL-generated viruses can be encrypted, can resist debuggers and can contain up to 10 of 24 preprogrammed effects, including file corruption, file deletion, disk corruption and computer lock-up.

Some are wondering if it would be possible to fight fire with fire and write a virus that will seek out and destroy VCL-generated viruses based on unique strings of code within the program. Technically, this is possible, but security consultants, including David Stang at the International Computer Security Association (ICSA) in Washington, D.C., warn that a virus designed to destroy another might easily become more of a problem than the one it seeks to dismantle. In other words, you can knock a wing off

Continued on page 41

Can CA break its mainframe shackles?

Analysts have mixed feelings about vendor's chances of gaining major PC software market share

BY THOMAS HOFFMAN
CW STAFF

ISLANDIA, N.Y. — Best known as a mainframe software company, Computer Associates International, Inc. is launching its latest personal computer software push in part by trying to leverage its mainframe strength.

But the company faces a string of challenges as it tries to boost its PC market presence by promoting links between desktop systems and its host-based software and by expanding its Microsoft Corp. Windows and database products. One challenge is its own identity.

"We've become a very Windows-oriented company, and I wasn't even aware that CA has Windows-based products," said



CA's Sokol: Making analysts aware of firm's PC plan

cation development-based products, either through acquisition, development or migration from its mainframe cache. Some of CA's PC products are downsized versions of their mainframe counterparts, such as the CA-IDMS PC database management system.

Upcoming ports to IBM's OS/2 2.0 operating system and other near-term releases will increase CA's PC product portfolio, but the question remains whether the \$1.5 billion software giant can wrest any

sizable market share away from PC software powers such as Microsoft, Lotus Development Corp. or Borland International, Inc.

Divided they stand

Analysts are divided on the issue. "I think the biggest misconception [about CA] is that since they've been dominant in the mainframe market, they don't understand the desktop, or that they'll acquire [PC software] products and kill them," said Shaku Atre, president of Atre, Inc., a Rye, N.Y.-based consultancy.

Atre said she believes it will take time for CA to carve its niche in this market. One way to accomplish this, Atre said, is for CA to develop bridge software to link mainframe and desktop computers by utilizing its mainframe software expertise.

Sanjeev Varma, a senior analyst at New Science Associates, Inc. in Mountain View, Calif., said he does not give CA much of a chance to excel in the PC software industry because he be-

lieves the company is poorly positioned against industry leaders. But he said CA can achieve some level of success in the PC arena if it can provide transparent access from the desktop to other platforms and offer a wide range of superior products. "Otherwise, they can't make much of a dent in the PC software market," Varma said.

Marc Sokol, CA's director of product strategy, said he is trying to change what he sees as an-

alyst misconceptions about CA's PC direction. "Because we're not dominant in areas such as word processing and spreadsheets, analysts aren't aware of us," said Sokol, who recently embarked on a barnstorming tour to raise analysts' awareness of CA's PC software strategy.

Presently, only 10% to 12% of CA's annual revenue is PC software-based. However, those figures only include shrink-wrapped software and retail

Continued on page 42

CA's lineup

CA-dBFast: A dBase/Xbase development language and database for Microsoft Windows. Currently available in Version 1.7C, will be upgraded to Version 2.0 by November. Expected enhancements include an active dictionary/repository, a visual application designer and improved performance of the database engine.

CA-Clipper: A dBase/Xbase-compatible database compiler for Microsoft's DOS operating system environment. Currently available in Version 5.01, Version 5.2 is due for beta testing in November and will include object-oriented enhancements.

CA-SuperProject for Windows: A project management software package that exploits Windows' Multiple Document Interface.

CA-PHIPS: A high-resolution image processing system for Windows.

CA-SuperCalc: A Lotus Development Corp. 1-2-3-compatible spreadsheet for MS-DOS users.

CA-Cricket Presents: An integrated desktop presentation program for Apple Computer, Inc. Macintosh and Windows environments.

CA-Compete: A multidimensional management and decision tool for Windows that can manage up to 12 business dimensions.

CA-Texttor: A Windows word processor.

ACCPAC Simply Accounting: An entry-level accounting system.

THOMAS HOFFMAN

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Jonathan Sayles, Technical Editor, DB2 Systems Journal

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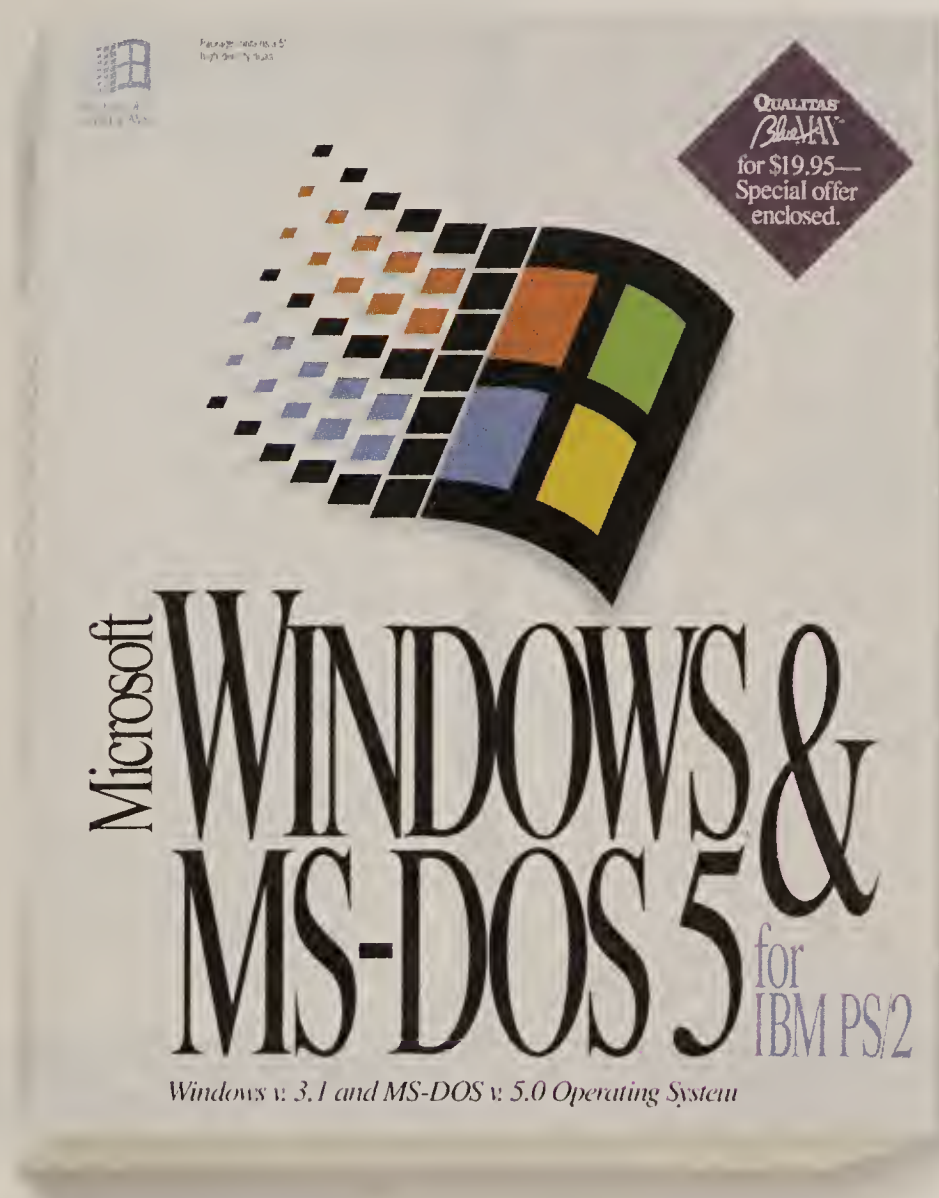
These days, just about every PC manufacturer out there ships the Microsoft® Windows™ operating system with its PCs. That includes 9 of the 10 largest PC makers worldwide: ACER, AST Research, Compaq, NEC, Olivetti, Packard Bell, Tandy, Toshiba and Zenith Data Systems.*

Why? Because PC manufacturers know that people want the ease of use

that Windows has to offer. In fact, to make it even easier for you, many of them preinstall Windows. Just look for the Microsoft Windows Ready-to-Run logo when you buy a PC. It means that virtually all you have to do is plug in your new computer, and you're ready to run.

If you're getting a PC from that other manufacturer in the top 10, we've got

Now you can make your new PS/2 just as easy.



something for you, too. We've integrated Windows 3.1 and MS-DOS® 5 in a single package specifically designed for the IBM® PS/2®. You'll find that the improved speed, reliability and usability of Windows will also make your PS/2 easier to use.

For a limited time, get Windows and MS-DOS 5 for IBM PS/2s for \$149.95** from your PS/2 reseller.

In fact, you can ask your reseller to install it on your new PS/2, so you'll be ready to run, too.

For information on participating resellers, give us a call at (800) 541-1261, Department HH5.

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Making it easier

THIS IS WHAT A MASSACRE LOOKS LIKE IN THE WORLD OF APPLICATION DEVELOPMENT.

DATAPRO DBMS USER SURVEY

	PROGRESS SOFTWARE	SYBASE	INFORMIX	INGRES	FOCUS	ORACLE
ATTRIBUTES						
Reliability	9.3	8.7	8.9	8.1	7.7	8.8
Ease of Use	9.1	8.2	8.2	7.9	7.9	7.4
Ease of Install/Upgrade	8.9	8.0	8.8	7.1	8.1	7.6
Price/Perform Return	9.1	8.3	8.5	7.5	8.1	7.1
FUNCTIONALITY						
Flexibility	9.1	8.8	8.6	9.0	8.4	8.6
Interface Capabilities	8.9	8.9	8.4	8.7	8.7	8.0
Comprehensiveness	9.1	8.8	8.8	8.3	8.7	8.7
User Friendliness	8.9	7.7	8.3	7.9	7.5	7.3
OS Compatibility	9.6	8.4	8.9	9.1	8.8	9.0
PRODUCT SUPPORT						
Documentation	9.0	8.2	8.6	5.7	6.2	7.3
Vendor Training	8.7	7.9	8.0	7.2	7.6	8.0
Problem Response Time	8.8	7.5	7.2	6.1	6.4	6.7
Quality of Vendor Support	9.0	7.8	7.5	6.4	6.9	7.0
Frequency of Releases	8.5	7.5	6.7	7.2	7.7	7.2
Response to User Request	8.8	7.5	7.8	7.0	7.0	7.3
Overall Satisfaction	9.3	8.7	8.5	8.3	8.0	7.9

Compiled from the 1991 DataPro Reports on Software/Computer System Series Software, available for each product listed (Sybase from 1992). The results are those of actual users of the products as surveyed by DataPro.

VARBUSINESS DBMS REPORT CARD

	PROGRESS SOFTWARE	INFORMIX	ORACLE	ASHTON- TATE	INGRES
PRODUCT FEATURES					
Ease of use	9.02	7.07	6.00	6.19	5.90
Memory requirement	7.37	6.16	4.25	6.19	5.22
Ease of programming	9.03	7.09	6.06	6.20	5.90
Ability to manipulate data	9.19	7.41	7.44	6.81	5.67
Sorting capabilities	9.02	7.44	7.69	6.65	5.78
Provision for software security	8.56	6.93	7.28	5.07	5.78
Report writing capabilities	8.39	6.72	6.59	5.71	4.11
Ease of use of interface	8.51	7.05	6.15	6.10	6.10
Software integration capabilities	8.34	7.26	7.24	6.27	6.10
Ease of data retrieval	9.08	7.68	7.66	6.61	6.11
Satisfaction with product profitability	8.26	7.04	6.22	5.58	5.13
Overall quality of product	8.94	7.37	6.69	6.32	5.44
Product Features Average	8.64	7.10	6.61	6.14	5.60
SUPPORT FEATURES					
Provision for customer support	7.74	5.98	5.76	5.77	5.50
Charges for training time	6.88	4.49	4.59	5.64	4.56
Provision for technical support	7.81	5.76	5.72	5.87	5.22
Provision for marketing support	6.89	5.88	6.09	6.13	3.80
Documentation & product information	8.74	6.73	6.56	6.45	5.56
Frequency of updates & revisions	8.35	5.88	6.34	5.57	5.00
Support Features Average	7.73	5.79	5.84	5.90	4.94
Overall Average	8.34	6.66	6.35	6.06	5.38

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Rated on everything from performance and reliability to service and support, PROGRESS trounces all of its competitors in the 1991 Datapro user surveys and the 1991

VARBUSINESS Software Report Card.

Topping the Datapro surveys for the fourth year in a row, users give PROGRESS a rating of 9.3 for overall satisfaction. The highest mark ever awarded.

Against all comers, PROGRESS is unsurpassed in all 15 categories (okay, we tie once). With a 9.0 or higher in eight categories.

PROGRESS SOFTWARE

Also, PROGRESS becomes the first product ever to capture all 18 categories of the VARBUSINESS Report Card. Racking up 9's in

five categories, where no one else even gets an 8. Anywhere. So, if you're considering a 4GL/RDBMS for building and implementing high performance applications that are fully portable across major platforms, isn't it time you

rated PROGRESS? For more information about our products and services, or for our fully functional Test Drive, call 800-4PROGRESS.

PROGRESS applications are fully portable across the broadest spectrum of hardware platforms, operating systems, network protocols and user interfaces. So many, in fact, that we had to list them here in small type: AIX,™ CTOS, HP/UX,™ NOVELL NLN, OSF/1,® OS/2,® OS/400,™ UNIX,® ULTRIX,™ VMS,™ XENIX,® MICROSOFT® WINDOWS,™ X WINDOWS,™ DECnet,™ LAN MANAGER,™ NetBIOS,™ NOVELL® SPX/TPX, TCP/IP and SNA APPC LU 6.2. Also, PROGRESS lets you process information in other databases, including AS/400, C-ISAM,™ CT-ISAM,™ ORACLE, Rdb, and RMS.

See us at Unix Expo, 9/22-24, The Javits Convention Center, in booth #735

CPWADV0817

Daly

CONTINUED FROM PAGE 37

an attacking aircraft and make it useless, but it has to crash somewhere.

Others suggest more severe legal measures that include shutting down all the virus bulletin boards in the world.

In last month's issue of ICSA's "Virus News and Reviews," Certus International Corp. Chairman Peter Tippet called for legislation that would make the creation, modification, sale or distribution of a virus punishable by a fine, imprisonment or both.

■ TRW continues to be a popular target for malicious hackers. Two unidentified persons have used the "Ripco" bulletin board to electronically publish a detailed manual, complete with dial-up numbers, geographical codes and methods for conning bureau subscribers into divulging their passwords, for penetrating TRW's credit bureau database. How did they get the information? One author of "TRW Masterfile" claims to have worked at TRW in customer service for two months.

TRW spokeswoman Susan Murdy downplayed the manual, saying her company is moving to a new security system and the manual was more focused on conning unsuspecting subscribers out of their passwords than hacking.

■ Have you experienced a virus attack on your Macintosh network recently? Microcom may be able to help. The Norwood, Mass.-based firm has announced Virex 4.0, an antivirus package that detects and eliminates viruses on an Apple Macintosh-based network.

Using Virex 4.0, network administrators can do a network-wide scan for viruses, schedule periodic network scans and disinfect computers across AppleTalk and Ethernet networks. Virex 4.0 is scheduled to begin shipping in October with a suggested retail price of \$99.95.

■ Dallas oil mogul T. Boone Pickens and former Republican congressman John J. Rhodes are among the backers of Digital Development Corp. (DDC), a Phoenix-based company that has developed a unique hardware and software solution for fighting viruses.

While many virus scanning applications require knowledge of a virus' signature to detect its presence, DDC uses memory stored in a computer chip to search out the rogue programs.

DDC's hardware scans the hard disk of a computer before the software is run. Once the integrity of all operating system files is verified, the normal boot sequence is allowed to finish.

If corrupted files are detected, the boot sequence is temporarily suspended and the cor-

rupted files are repaired or replaced.

DDC President Stephen A. Lentz said the firm hopes to license the technology to a chip-making company and have the product on the market as part of a semiconductor package within a year.

■ Security Dynamics, Inc. (SDI) in Cambridge, Mass., recently made its ACE/Server se-

curity product available to remote users by adding support for Cayman Systems' Gator-Link AppleTalk Remote Access (ARA) server. The ARA allows users of Apple's PowerBook or Macintosh computers to simultaneously dial in to a network.



access code displayed on their SecurID card to gain access to a

At the heart of SDI's technology is the SecurID Card — a token displaying a randomly generated access code that changes every minute. Users enter their personal identification number followed by the current

computer system or network. ■ Mark Nov. 16-18 on your calendar for the Computer Security Institute's 19th Annual Computer Security Conference in Chicago. A who's who of the computer security industry is expected to attend. Call (415) 905-2626 for more information.

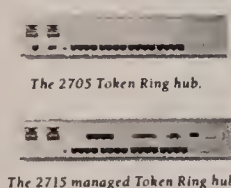
Daly is a *Computerworld* West Coast senior correspondent.



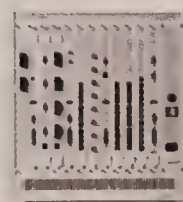
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density, multiple-access method environments we offer our System 3000 hub. What's more, our 16 Mb/s UTP solutions assure IBM interoperability. And all our hubs are based on SNMP standards. At SynOptics, we believe that flexibility in Token Ring solutions is paramount. On this point, we simply refuse to bend.

Call 1-800-PRO-NTWK, ext. 87 for some hard facts on our Token Ring hubs. GSA#: GS00K-92-AGS-5494.

SynOptics

HELP LINE

Quattro Pro 4.0



Part of a series of tips provided by PC software vendors and based on questions commonly asked of their customer support personnel. This week's tips focus on Borland International, Inc.'s Quattro Pro.

Q Why won't my mouse work with Quattro Pro 4.0 when I run it in Windows?

A Windows uses its own mouse driver. You need to install the mouse driver that came with the mouse in order for Quattro Pro to use it.

Q I can't get Quattro Pro 4.0 to use fonts. It also will not print landscape. Why?

A Your destination is probably set to PRINTER. Under the /Print/Destination menu, there are two categories: Draft printing and Graphic printing. In order to get fonts, or landscape output, choose one of the graphic quality destinations. Try setting the destination to GRAPHICS PRINTER.

Q In Quattro Pro 3.0, the color of the spreadsheet in character mode was blue. In Quattro Pro 4.0, it is black. Is there any way to get it back to the way it was?

A From within Quattro Pro 4.0, choose Options Colors Palettes Version 3 colors.

Q The Quattro Pro 3.0 installation asked me which fonts I wanted to build. The Quattro Pro 4.0 installation didn't build any.

A Quattro Pro 4.0 uses Bitstream's new scalable font technology. Since it builds fonts very quickly, Quattro Pro 4.0 will build the fonts when you print, as it needs them. This saves you disk storage space.

Q Why am I getting asterisks in my spreadsheet columns instead of numbers?

A The column is not wide enough for all the characters in the cell. Simply increase the width of the columns to accommodate them.

Q When I print a spreadsheet with line drawing in it, the bottom line and the last line on the right do not print.

A The information for line drawing is stored in the top and left area of each cell. The information for the bottom line and left lines are therefore in the row below and in the column to the right. Be sure to include these rows in your print block when you print.

Can CA break shackles?

CONTINUED FROM PAGE 37

sales, Sokol said. Other software products, such as CA-IDMS-PC, CA-OPERA-PC and CA-DATACOM-PC, interoperate between PC and mainframe environments. Because they are not distinct PC products, Sokol said, their sales are not included under PC software revenue.

The company has made inroads into certain markets, such as application development. In June, CA acquired Nantucket Corp., a Los Angeles firm widely known for its Clipper dBase/Xbase-compatible database and application development tool set.

Later that month, at PC Expo, CA announced its strategy to continue separate development activities for both CA-Clipper, as it is now known, and CA-dBFast, its own Xbase/dBase development suite for Windows.

Both paths will eventually lead to CA's next-generation, object-oriented platform, called Aspen. Aspen will be demonstrated at Comdex/Fall '92, with availability for beta testing in the fourth quarter.

Three years behind?

Yet Varma said he believes CA will continue to lag behind Borland in the PC database market. Varma estimated that Borland commands a 70% market share and is "at least three years ahead of everyone else in terms of object-oriented development."

At CA, Sokol said the firm plans to focus on PC-based accounting and application development software. To gain market share in the PC arena, Sokol said, CA will continue its acquisition strategy when there is a financial or technological incentive to do so.

"Writing systems from scratch is very risky, and we'll only do it when we have to. If we can gain competitive advantage, we'll acquire," he said.

Sokol said he is also working to defuse criticism lodged by analysts who have said CA fails to support the user communities and products it acquires.

"We work very hard to make sure that PC support is exemplary," Sokol said. He added that CA is scheduled to announce a new PC support program later this month for its third-party developers. "We can't afford to get a [bad reputation] on our support for our PC clients."

When You Think

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For Applications That Last

NEW PRODUCTS

Peripherals

The Professional Electronics Division of Mitsubishi Electronics America, Inc. has introduced the AM-2752A.

The product is a 27-in. monitor that has a horizontal scanning range of 15.5 KHz to 39 KHz and a vertical scanning range of 45Hz to 100Hz, according to the company.

The AM-2752A was designed to perform in a variety of video applications ranging from computer graphics to large-scale presentations.

Analog sync, audio input and a switchable clamp function are included, and the

AM-2752A incorporates Mitsubishi's Dynamic Beam Forming technique.

The AM-2752A costs \$3,700.

**Mitsubishi Electronics America
Professional Electronics Division
800 Cottontail Lane
Somerset, N.J. 08873
(908) 302-2855**

Avery Commercial Products Division has introduced Microsoft Corp.'s Windows-based software for its Personal Label Printer.

The labeling software is compatible with Windows 3.0 and 3.1 and supports Windows TrueType fonts. According to the company, the product features so-

phisticated graphics, clip art and address recognition.

Users can import logos and graphics, change fonts and place text anywhere on the label template.

An Auto Print mode surveys the Windows clipboard for addresses, contains them in an address book and automatically prints labels in the background, according to the company.

The Avery Personal Label Printer, including the new software, costs \$249.95.

**Avery Commercial Products
Division
818 Oak Park Road
Covina, Calif. 91724
(818) 915-3851**

Samsung Electronics America's Infor-

mation Systems Division has started shipping Finale 8000.

Finale 8000 is a 300 dot-per-inch non-impact laser printer modeled after Intel Corp.'s 1960 32-bit reduced instruction set computing processor. The product is optimized for use with both Microsoft Corp.'s Windows 3.1 and all Apple Computer, Inc. operating systems, including System 7.0.

Finale 8000 has an assortment of features, including 14 bit-map fonts, Samsung Auto Emulation Protocol, one parallel and two serial ports and two Hewlett-Packard Co. font cartridge-compatible slots.

Finale 8000 costs \$1,995.

**Samsung Electronics America
Information Systems Division
105 Challenger Road
Ridgefield Park, N.J. 07660
(201) 229-4000**

SyDOS, a division of SyQuest Technology, has introduced SyDOS Puma 44 and Puma 88.

The Puma 44 and the Puma 88 are removable disk drives that use Winchester hard disk technology. Both products are external subsystems that have a self-contained power supply and a dedicated parallel port adapter. A removability feature allows users to transport, lock up and back up data.

According to the company, the products plug into the parallel port of almost any DOS or Microsoft Corp. Windows-based desktop, laptop or notebook personal computer.

The Puma 44 is priced at \$638, and the Puma 88 is priced at \$799.

**SyDOS
Suite 110
6501 Park of Commerce Blvd.
Boca Raton, Fla. 33487
(407) 998-5400**

Systems

Diamond Flower Electric Instrument has introduced Model 420VSX, an upgradeable personal computer.

The product is a complete system that can be configured to increase processing speed by using the company's Processor Upgradeable Microcomputer Architecture (PUMA) technology.

With PUMA, processing speed can be increased to 33 MHz by placing an Intel Corp. I486/33DX microprocessor into the PUMA daughterboard. Model 420VSX contains an Intel I486/20SX CPU and has the ability to send video signals directly to the CPU, according to the company.

Model 420VSX costs \$1,895.

**Diamond Flower Electric
Instrument
135 Main Ave.
Sacramento, Calif. 95838
(916) 568-1234**

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COMPUTERWORLD



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THE NEWSPAPER OF INFORMATION
May 4, 1992 • Vol. XXVI, No. 1

COMPUTERWORLD

COMPUTERWORLD.

The Nonstop Computer Newspaper That Works for You.

8:12 a.m., Thursday. News Editor Alan Alper and Assistant News Editor Patricia Keefe meet at the Framingham home office to review the hottest news that's come in during the week from all over the world.

1:58 p.m. Stories continue to pour in. Alper meets with top editors and production people to map out the 12 late-breaking news pages. Art Director Nancy Kowal presents ideas for visuals that will bring the news stories to life.

6:09 p.m. Tokyo Correspondent Lori Valigfa receives a hot tip on a new technical advance in active matrix displays for PC's. She calls her sources in Japan to check out the rumor.

10:37 p.m. Alper, Keefe, and staff finish editing the final stories, clean up the pizza boxes, soda cans and shut down for the night.

8:02 a.m., Friday. The *Computerworld* staff filters into headquarters for the final push. Finished layouts must be at the printer by the end of day to make the deadline.

10:32 a.m. Maryfran Johnson, Senior Editor, transmits a story from the IBM Scientific Computing Conference in Palm Springs. IBM has announced the details of a major advance in RISC-based processing.

12:48 p.m. Midwest Bureau Chief Ellis Booker puts the finishing touches on a story about the first user of NCR's new parallel high-end processing system.

5:37 p.m. Electronic transmission of the latest news in IS is complete. The current issue of *Computerworld* is on its way to you.

The world of information systems never stops. And neither does *Computerworld*.

In fact, 58 reporters, editors, writers, and designers work around the clock and around the world to bring you the most up-to-date news in IS.

What's more from the time your issue rolls off the presses at midnight on Friday, it takes some 25 airplanes, 5 trains, 7 tractor trailer trucks, and 37 major city postal centers to deliver *Computerworld* to your desk by Monday morning.

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INSIDE OS/2, Unix facing net clash PS/2 tries

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LANs • SERVERS • SOFTWARE FOR GROUPS

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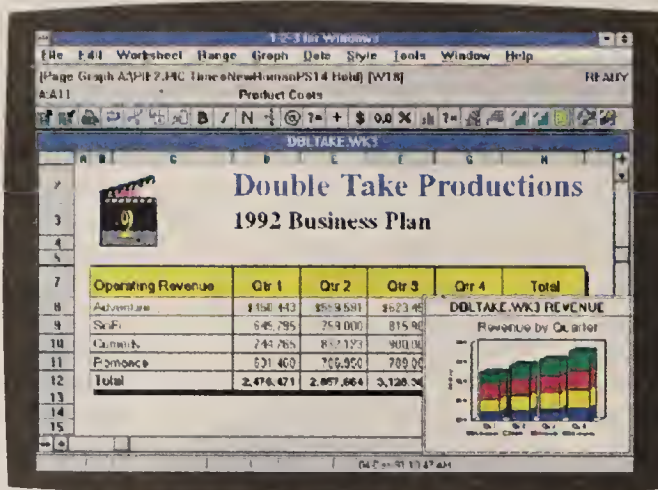
If you're looking for a better way to work in Windows,[™] SmartSuite[™] from Lotus[®] is one smart choice. Because not only does this suite of four award-winning Windows products offer you an incredible value for your money. It also delivers individually outstanding products that work together. Each shares a common interface. As well as common features like our unique SmartIcons[™] for one-click access to the tasks you perform most frequently. Which means the products work so much alike that when you learn one you've learned them all.

It's pure Windows.
Pure 1-2-3.



Take
1-2-3[®] for
Windows,
for example.

It brings you all the power of The World's Most Popular Spreadsheet,[™] including 3-D worksheets, automatic print compression and our unique Solver technology. And it now includes file compatibility with Microsoft[®] Excel, support for Windows 3.1 and overall improvements in its performance and speed. It even gives DOS users access to the 1-2-3 for DOS Classic[®] menu at the mere push of the slash key.

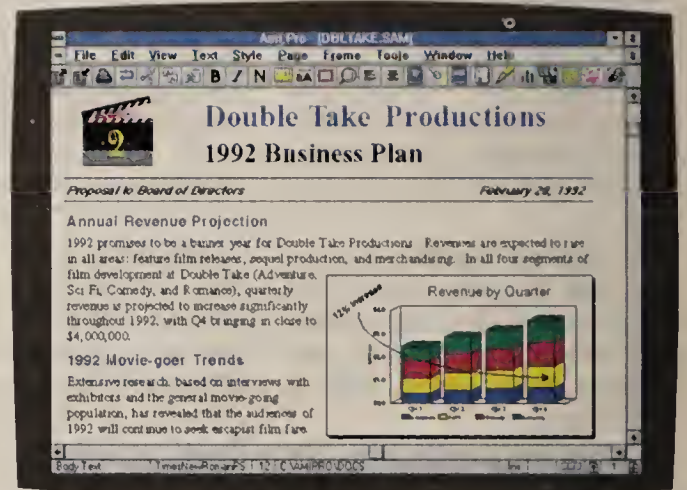


"Lotus 1-2-3 for Windows is completely Windows and completely 1-2-3."
—Windows Magazine, 11/91



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—PC Magazine, 11/21/91



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automatically manage the design and layout of your presentation for you. Simply select the design you like, follow the on-screen prompts and fill in the blanks with text and graphics. It's that simple. And if you've never used a presentation program before, QuickStart, its on-line tutorial, will get you up and running in minutes.

It lets you send text, files, graphics and facsimile items across all major platforms, like DOS, Windows, OS/2® and Macintosh®. It runs smoothly on any server or network operating system in any configuration. And its unique architecture makes it easily scalable to fit the size of your workgroup, whether it's five or 500,000.

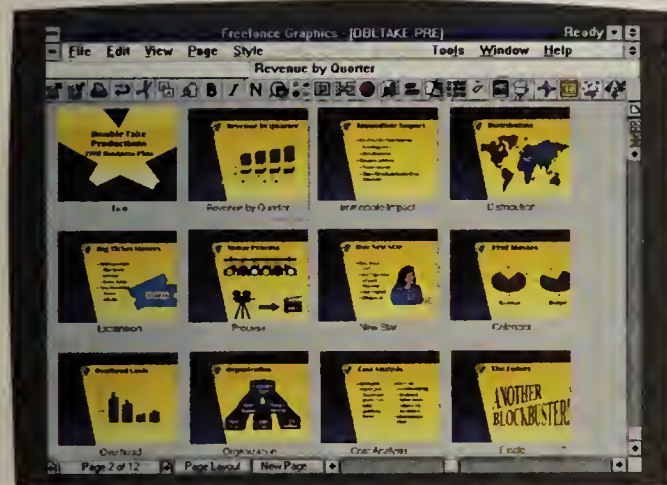
More good news? SmartSuite costs less than the price you'd expect to pay for two of these products. And it even includes a free Windows 3.1 tutorial from

Personal Training Systems®, complete with an audio cassette, manual and demo disk.

So if you still think that buying a suite of products from one company means sacrificing product excellence for price, we have two suggestions. Step back and consider what's in SmartSuite. Then

consider what's behind it...the most comprehensive service and support in the industry.

So do the smart thing. Call **1-800-872-3387, ext. 6848*** for more information and a free auto demo disk. Or simply visit your Lotus Authorized Reseller.

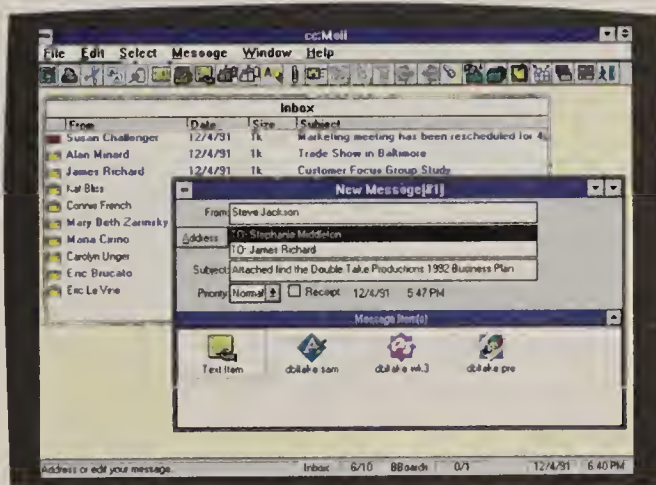


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—PC Computing, 11/91

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—PC World, 9/91

Lotus SmartSuite for Windows

1-2-3, Ami Pro, Freelance Graphics, and cc:Mail

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IN BRIEF

Sun/Xerox pact covers imaging

■ **Sun Microsystems, Inc.** and **Xerox Corp.** have signed yet another joint marketing and sales agreement, this time aimed at developing document imaging, information management software and integration services for the manufacturing and utilities industries.

Included among the Xerox applications that will run on Sun's SPARCstations and servers is Chess, an advanced

manufacturing and resource planning system; DocuPlex, an engineering documents management system; and Global-View workgroup productivity software.

Sun and Xerox expect to generate at least \$20 million in combined worldwide business during the next year, company officials said.

■ A recently announced systems integration contract between **IBM** and **Motorola, Inc.**'s Altair Product Operations in Arlington Heights, Ill., is intended to enable IBM's Customized Operational Services (COS) Division to resell Motorola's line of Altair wireless products through 200 IBM branch offices nationwide. Motorola's wireless product line includes the Altair Plus, a wireless Ether-

net local-area network, and the Altair VistaPoint system, a wireless LAN link for Ethernet networks up to 500 feet apart. IBM's COS organization sells physical network devices and consulting services.

■ **Powercore, Inc.**, a developer of network-based and stand-alone time management software for MS-DOS, Microsoft Corp.'s Windows and Apple Computer, Inc. Macintosh platforms, has introduced an enhanced version of its workgroup scheduling software and a single-user product.

The products, Network Scheduler 3 (\$395) and TimeVision (\$119), provide comprehensive scheduling options, full support for LANs and wide-area net-

works and import/export options for palmtop devices. They are packaged as combined Windows/DOS products to allow users to choose either version.

■ **GigaTrend, Inc.** in Carlsbad, Calif., is now shipping the company's MasterSafe tape backup software that backs up and restores multiple LANs and WANs using communications technology that complies with Novell, Inc.'s Storage Management Service. MasterSafe backs up data over Datapoint, Inc. ArcNet, Token Ring, Ethernet and fiber-optic topologies. MasterSafe's network backups or restores are performed at a tape station on the network rather than on the file server or workstation. MasterSafe is priced at \$2,995 for a software kit.

How to avoid Jet lag.

Choose accessories that keep pace with the fast HP LaserJet III Si printer.

With the 17-page-per-minute HP LaserJet III Si printer, it takes less time to print a page than to walk over and take it out of the printer. It's perfect for shared or networked environments.

Now you can add accessories designed to make your high-capacity printing solution even more productive. The new 1,500-sheet HP paper feeder lets your HP LaserJet III Si printer and the people using it get more done between refills. And switch between paper trays without getting up.

Your company will save even more time by keeping paper, toner cartridges, and other supplies in one convenient location—underneath the printer. The HP LaserJet printer cabinet is roomy on the inside, compact on the outside. It was custom designed to match the footprint of the HP LaserJet III Si printer with an HP paper feeder. Exactly.

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Enhance the high-capacity HP LaserJet III Si printing solution with the HP C2921A paper feeder, and the HP C2917A LaserJet printer cabinet.

hp HEWLETT
PACKARD

USL suit raises hackles

CONTINUED FROM PAGE 45

trayed as a harassment action intended to drive the small firm out of business.

Adding fuel to the furor, USL has so far refused to identify exactly which parts of the code have allegedly been copied in the BSD/386 system. "They're going to continue looking like the bad guys until they get around to showing that some violation really occurred," said Dick Dunn, a BSDI customer and president of Eklektix, a software development and consulting firm in Boulder, Colo.

One issue that particularly upsets BSDI's followers is a part of the lawsuit seeking to prevent BSDI from hiring anyone with extensive knowledge of Berkeley Unix source code. That is considered a chilling portent for future code-sharing and Unix development.

"There is nothing here of concern to Unix licensees," said Larry Lytle, a USL spokesman. "There is nothing for users of Unix technology to worry about and nothing here to concern programmers with extensive Unix knowledge."

Despite the outcry from one corner of the Unix market, "no one has flat-out denied [that] USL's intellectual property rights" are being violated, noted Maureen O'Gara, publisher of the "Unigram X" newsletter. The lawsuit, she observed, has "stirred up a hornet's nest of academic fear and loathing against USL and has created a cadre of naive tech weenies ready to form a lynch mob."

At Unix consulting firm /Sys/admin, Inc. in San Jose, Calif., the BSD/386 operating system is replacing USL's System V, Release 4 Unix, which was plagued with operational problems, company President Bjorn Satdeveza said. "Even if USL wins this lawsuit, there is no way we would continue with SVR4," he said, citing networking problems and system crashes. "We're going ahead with BSDI and hoping for the best."

Analysts who follow the commercial Unix market had little sympathy to spare for BSDI's role as David to the Goliath of USL and AT&T. "The academic communities had free access to Unix source code, and these guys from BSDI thought they could take it and build a business on it," said Rikki Kirzner, a Unix analyst at Dataquest, Inc. in San Jose. "Now USL is putting the nail in the coffin and right through their heads."

Unix is their Choice for long-term growth

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Downsizing usually infers migration from large, centralized environments to smaller, less powerful distributed systems. At Choice Courier Systems, Inc., downsizing actually meant rightsizing to a smaller but more powerful transaction-intensive system while staying with the Unix environment.

Choice, which claims to be the nation's largest land-based courier service, is a 28-year-old, \$40 million company with 500 motorized couriers and 700 foot couriers who deliver packages primarily in the Northeast and Mid-Atlantic states.

In six years, Choice has driven its order processing system from a slow, manual one handling 2,500 orders per day to a highly automated system processing more than 9,000 orders daily. In between, the company went through several generations of a customized host-based Unix system. Today, Choice runs its business on a Data General Corp. Aviion server that was designed to handle the ongoing growth and to provide higher reliability than the previous system.

Looking back to 1985, Mike Beck, vice president of finance and administration at Choice,

said the company searched unsuccessfully for off-the-shelf software programs to fit its transaction processing needs before deciding on a hardware platform. Because no one on staff at Choice had the technical background to build a system, Choice decided in 1985 to work with Precision Programming, Inc., a Ridgewood, N.J.-based consultancy.

Unix the choice

Charles Fishman, president at Precision, suggested that Choice develop its own Unix-based software programs and convinced Beck that Unix was the operating environment of the future. Beck sent Gerry Daley Jr., Choice's billing manager who had been designated as the future data processing manager, to work with Fishman at Precision for six months.

In 1986, Fishman and Daley developed Unix-based programs written in C. Choice then purchased a Unisys Corp. XE 550 midrange system in early 1987. The system ran AT&T's Centex operating system software, an early version of Unix. It supported 75 users, including dispatchers using personal computers at seven offices in New York with connections through modems and multiplexers.

Within months, heavy trans-

action processing brought system crashes. The problem was caused by the inability of the system software to handle the company's expanding transaction processing load.

cessing at the company.

"We had never developed disaster recovery or fail-safe programs, so it all became a harsh reality," Beck added.

Daley said Unisys support staffers worked to modify the system to support increased transaction processing, and Choice was able to add 50 users from 1987 to 1991.

During this time, Choice grew, mainly through the acquisitions of several New York-based couriers. To handle the growth, Choice added two Unisys minicomputers and automated its branch operations. But by 1990 the systems were "maxing out," according to Daley, and Choice began looking at new platforms in conjunction with plans to move to a new corporate headquarters.

Precision tested a dozen different machines for Choice, including an IBM RISC System/6000. After putting the units through rigorous transaction processing testing, only one machine met all of Choice's specifications, Daley said: a four-

processor DG Aviion 6240 mid-range computer.

Daley and Beck cited several reasons behind the decision. "It seemed that Data General was more committed to Unix than any of the other vendors whose systems we tested," Beck said.

Impressive R&D

Beck was also impressed by DG's research and development efforts with Unix. Although Beck said the company's relationship with Unisys was excellent, the Blue Bell, Pa.-based computer maker had stopped manufacturing the particular model Choice was using. "Maintenance became very expensive," he said.

Daley said DG's use of redundant arrays of inexpensive disks (RAID) for storage also played a key role in Choice's decision. "Downtime is very costly to us," Daley said. "If a [circuit] board blows out, it's easy to replace. But if you lose a [disk] drive, then there's a long process to recover the data. RAID rebuilds lost data on its own."

Daley added that the Aviion system, which was up and running by July 1991, was designed to support 1,000 users. Choice now has 150 users on the system.

Choice has since installed single-processor Aviion 4300s in its Washington, D.C., and New Orleans offices. Choice's Boston office will continue to use a Unisys minicomputer.



Choice Courier Systems New York

- **Challenge:** To replace a processing system that could no longer handle growth in a business that went from 2,500 to 9,500 deliveries per day in a five-year span.
- **Strategy:** Replace Unisys minicomputer with more powerful Data General Aviion server.
- **Expectations:** Aviion was designed to handle several times more than the firm's current 130 active users and to provide higher reliability with RAID storage subsystem.

"Unix couldn't handle all the system calls from dispatchers, finance, accounting and several other departments," said Daley, who is now director of data pro-

NetWorker updated

PALO ALTO, Calif. — Legato Systems, Inc., a vendor of backup and recovery software, recently announced NetWorker 2.0, a new version of its backup software for Novell, Inc. NetWare sites. NetWorker was designed to allow a NetWare-based server to back up and recover data from both NetWare and Unix-based systems.

The new release, which is scheduled to be shipped this month, reportedly allows a NetWare 3.11 server to back up and recover data from NetWare 3 series servers and from 11 popular Unix platforms, including computers from Sun Microsystems, Inc., IBM and Digital Equipment Corp. The NetWorker product is installed on a NetWare 3.11 server with an attached tape drive and can be ordered with optional high-capacity cartridges or jukebox support, according to the company.

Prices range from \$750 for up to 10 clients to \$4,000 for 250 clients. Client software is available in either high-end Unix workstation or 386-based packages priced at \$1,500 each.

MICHELE DOSTERT

Microsoft refocuses strategy

CONTINUED FROM PAGE 45

Windows platform; and when they do, the low-end market will shrink considerably."

Microsoft is also bundling free connectivity with its 32-bit Windows New Technology (NT) product, due out by the end of 1992. Although Microsoft has not yet announced specifics, it is expected that Windows NT will be shipped with both the client and server pieces of LAN Manager bundled in. This will allow users to set up a multiserver, single-domain client/server LAN without extra cost.

"Basically, Microsoft is giving away LAN Manager with Windows NT, hoping to lure users to the LAN Manager NOS," Lewis said. "But I don't think NetWare users will throw away their NetWare LANs just because they now have NT. Even though the LAN software will be free, the cost of changing over and retraining and supporting the new LAN will be high."

Lewis said Microsoft's bundled network operating system/operating system strategy may do well with users who have not yet chosen a LAN operating system; however, that market is shrinking, he said.

For users who need the multi-

platform connectivity and the multiple-domain security and management of a full LAN Manager network operating system, Microsoft will offer the product on both OS/2 and Windows NT.

Tool box

Microsoft plans to ship enhancements to LAN Manager 2.1 in September. The products, positioned as a productivity package, will include the following:

- A Windows administration tool that lets LAN supervisors remotely administer Windows clients.
- New Windows client software.
- A DOS/Windows Printstation utility that allows any workstation to act as a print server.
- New OS/2 2.0 client software.
- New Systems Network Architecture connectivity utilities and protocols.

The Windows NT version will be released simultaneously with Windows NT. LAN Manager NT, with a 32-bit kernel, will compete head-to-head with Novell's NetWare 3.11 and yet-to-be-released 4.0. Most analysts said they expect Microsoft to roll out a string of enterprise connectivity add-ons to NT LAN Manager in 1993 and 1994.

Microsoft's current LAN Manager product, 2.1, is based on an earlier 16-bit OS/2 — not the 32-bit OS/2 2.0 that IBM is currently shipping. Given the current state of often-public hostility between IBM and Microsoft, some LAN Manager users are uneasy about Microsoft's continued commitment to their OS/2-based LAN Manager.

Microsoft has said it will do an OS/2 2.0-based LAN Manager but is not yet committing to dates. "We don't consider OS/2 2.0 to be solid yet, especially with IBM admitting that it is rewriting the graphics part of it," said Ruth Warren, Microsoft's product manager for LAN Manager. "Moving to an OS/2 2.0 platform isn't trivial — all the drivers have to be rewritten, for instance — and we want to make sure it's solid before we start."

Warren said Microsoft is also committed to transparent interoperability between OS/2- and NT-based LAN Manager.

DCA unveils DECnet tool

ALPHARETTA, Ga. — Personal computer-to-host connectivity supplier Digital Communications Associates, Inc. (DCA) recently announced a version of its IrmaLAN Windows client for Digital Equipment Corp.'s DECnet/SNA Gateway.

The new product is intended to allow users of Microsoft Corp. Windows in a DECnet environment to access IBM mainframe applications via IBM's Systems Network Architecture (SNA).

It was designed for users of DEC's Synchronous Data Link Control or channel-attached DECnet/SNA Gateways in DEC Pathworks-based networks who need IBM 3270 terminal emulation in the Windows environment.

The new IrmaLAN Windows client is for use with Windows 3.1 and includes support for up to five sessions, copy and paste, a variety of productivity tools, DCA's QuickScript application and graphical keyboard remapping. The client also supports All Points Addressable graphics, which allow users to view and paste mainframe graphics into Windows applications.

Apple announces a between Windo

Apple has long been known for breakthroughs. Apple pioneered desktop publishing. Apple was first to bring the quality of Adobe™ PostScript™ to popularly priced laser printers.

Apple was the first to make high-resolution scanning as easy as one touch of a button. And Apple® LaserWriter® printers remain among the highest-rated printers for image quality and durability.

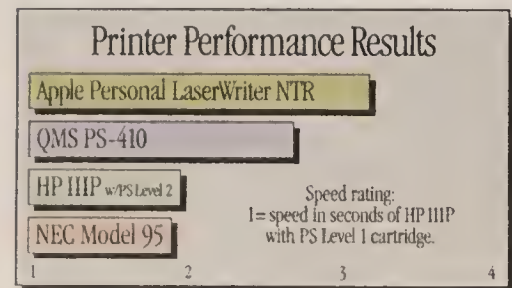
Now, Apple is extending all those breakthroughs to people who use PCs and Windows.

The fastest printer in its class for PCs.

With a RISC controller that assembles pages at incredibly high speeds, the Apple Personal LaserWriter NTR is

significantly faster than a similarly equipped Hewlett-Packard LaserJet IIIP. Yet it costs less.

The LaserWriter NTR comes standard with Adobe PostScript Level 2 and LaserJet II PCL com-



The RISC-based Personal LaserWriter NTR dramatically outperforms the HP LaserJet IIIP, the QMS PS-410 and NEC Model 95.

patibility, a parallel port to connect to your Windows PCs and an AppleTalk™ port to connect to your Macintosh® computers. And since both of these ports are simultaneously active, it can receive documents from both Macintosh and PC users without flipping any switches.

The PC-compatible Personal LaserWriter NTR.

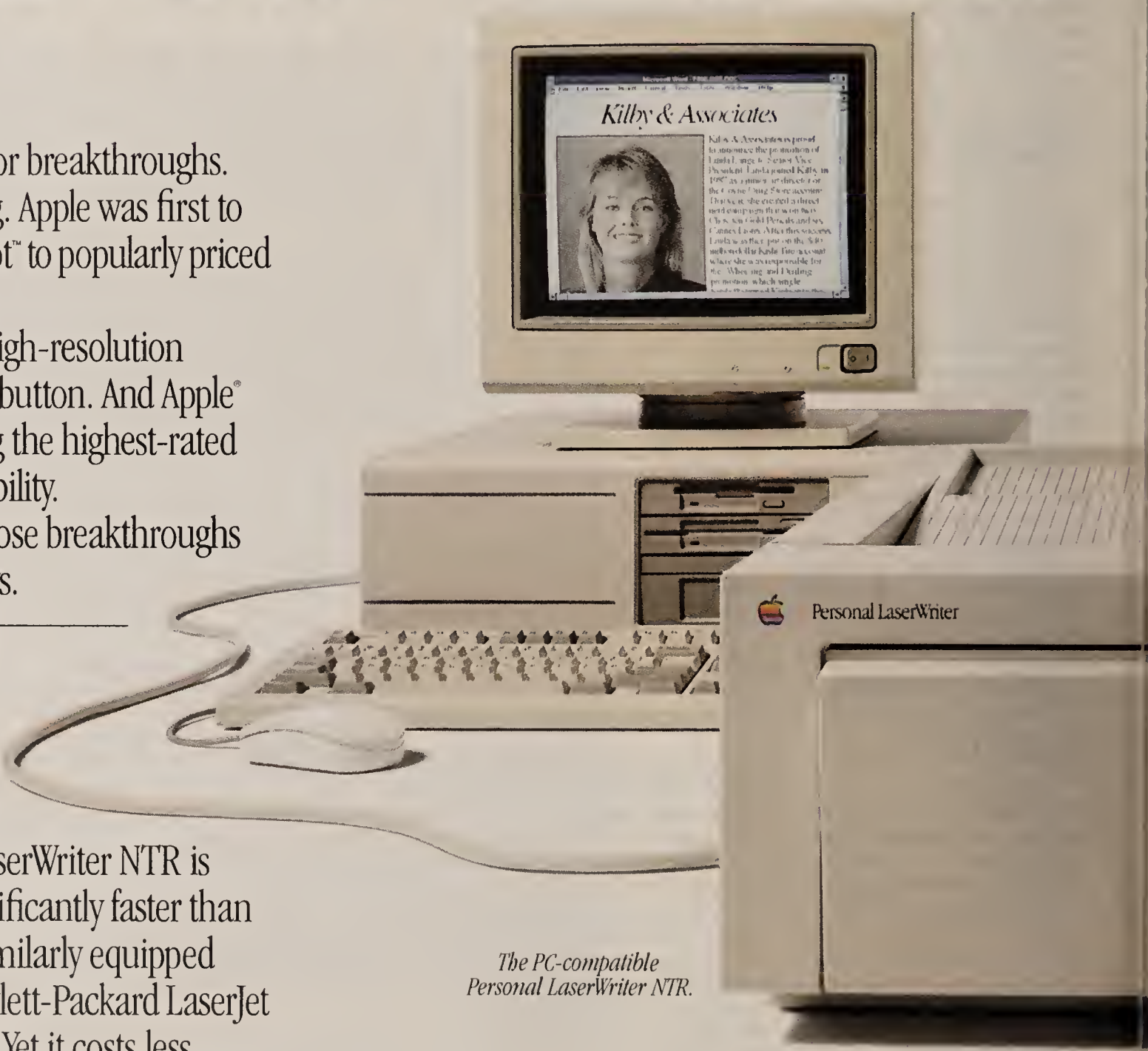
So the LaserWriter NTR is not just faster. It's also more flexible.

The first PhotoGrade printer for PCs.

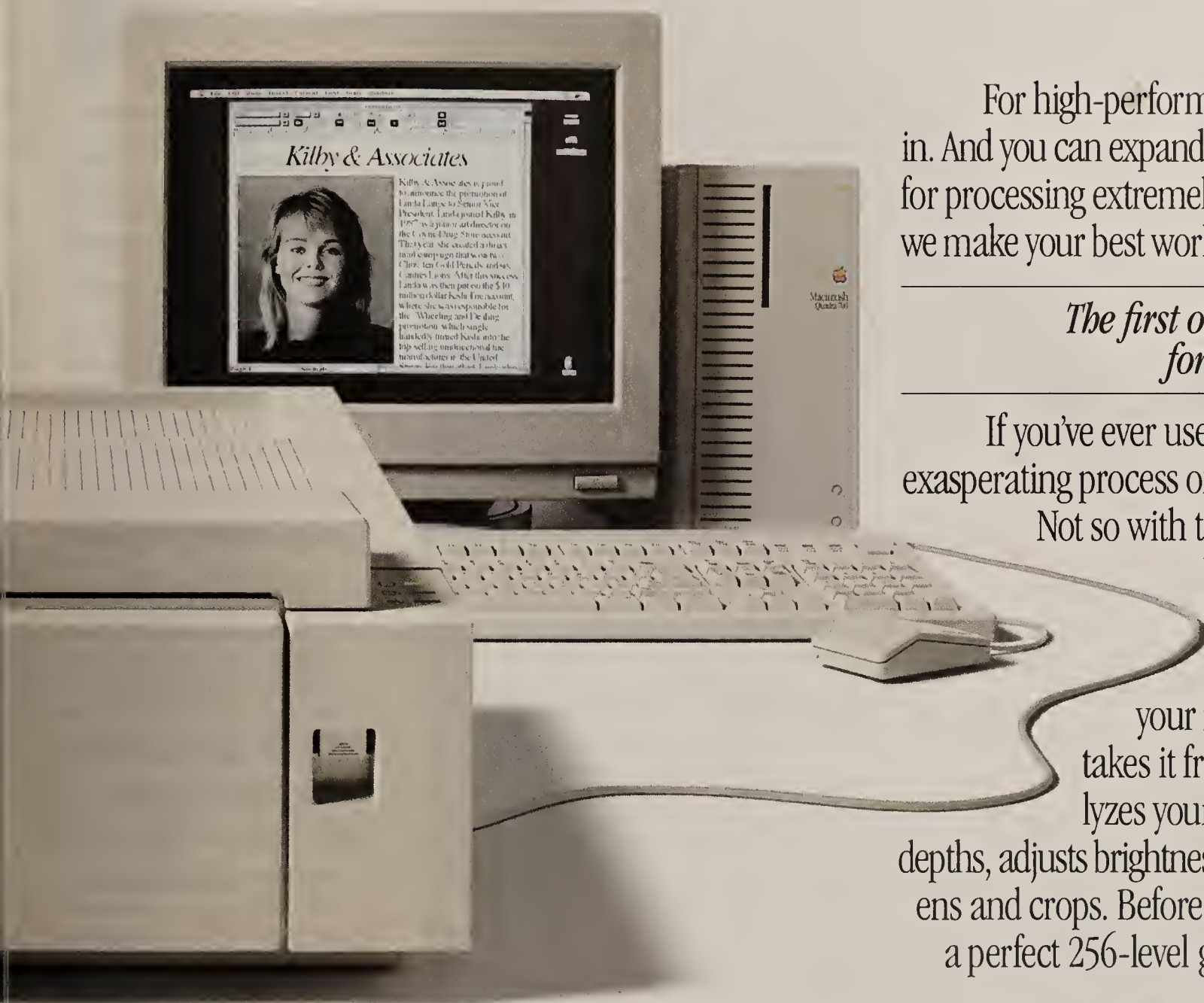
Like the LaserWriter NTR, the Apple LaserWriter IIg works equally well with both Macintosh and PCs. But it adds an innovative Apple gray-scale technology called PhotoGrade™



On the left, conventional laser printing. On the right, Apple PhotoGrade printing. Which will do more for your image?



major breakthroughs and Macintosh.



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The first one-touch scanner for Windows.

If you've ever used a scanner, you know it's an exasperating process of fiddling, futzing and adjusting. Not so with the Apple OneScanner™ for

Windows. You simply pop your photograph or other artwork onto the scanner and click your mouse once. The OneScanner takes it from there. It automatically analyzes your image, sets the dpi and bit depths, adjusts brightness and contrast, and even straightens and crops. Before you know it, you've got yourself a perfect 256-level gray-scale scan.

One click. It's really that easy.

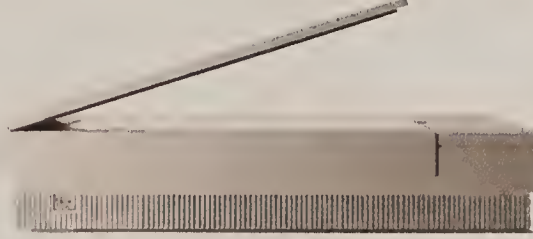
Your authorized Apple reseller will be glad to demonstrate just how much these breakthroughs can do for all

that delivers pages with image clarity comparable to 800 dpi.



The PC-compatible LaserWriter IIg.

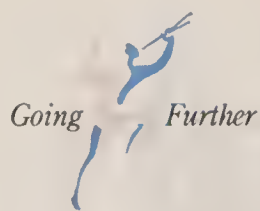
Documents that incorporate photographs look nothing short of amazing. And with Apple's exclusive FinePrint™ technology, even text and line art have sharper edges and smoother curves than ever before.



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COMMENTARY

Joanie M. Wexler

'Open, channel D'



Communications managers who were fans of *The Man from U.N.C.L.E.* TV show in the

1960s probably recall with cynicism how agents Napoleon Solo and Illya Kuryakin effortlessly tapped into U.N.C.L.E. headquarters in New York from obscure global sites that barely had running water — let alone digital phone service.

For communications support in their weekly, mission-critical task of thwarting world annihilation, Nappy and Illya would simply whip out wireless, pencil-size devices, flip a switch and mutter "Open, channel D" into them. Never once did they fail to be rewarded with an instantaneous, clear-as-a-bell connection to U.N.C.L.E.'s head honcho, Mr. Waverly.

Public network architects should have paid close attention to Waverly's boys. After all, U.N.C.L.E. really foreshadowed an imminent goal of corporate communications users in today's global environment: one for personal, dial-up voice/data phone numbers or addresses assigned to individuals rather than to fixed work areas.

Ease is the key

The concept is to allow users to access who and what they want from wherever they are — and to do so without having to fiddle with technology any more than Nappy and Illya did. This becomes a particularly thorny challenge in this dawning era of bandwidth-voracious client/server applications.

There is no question that on-the-road users not yet spoiled with functionality bestowed by their IS departments — and/or by our bank machine-on-every-corner society nourishing the Type A population — soon will become more demanding. Today, most of us accept limited (and often frustrating) connectivity while on the road.

But, soon, nomadic users accustomed to full client/server access in the office will be hounding IS to let them interact with full-blown graphics and other high-bandwidth applications.

Continued on page 57

Sending fax as data can cut phone bills

ANALYSIS

BY GARY H. ANTHES
CW STAFF

A few large users have discovered they can speed transmission, improve quality and lower the cost of sending fax traffic by shipping it over data networks instead of analog telephone lines. However, despite much talk of merging fax and computer technology, few have taken the concept very far.

Experts say that users have not worked harder to improve the way fax is handled because they have no idea how much they are spending on the fastest growing of all communications media.

One company on the leading edge is Tokyo Electric Power Co., which sends its fax traffic between Washington, D.C., and Tokyo via data lines leased from AT&T, using advanced CCITT Group 4 digital fax equipment that offers store-and-forward transmission. According to Jose Conto, an electrical engineer, this allows the company to schedule faxes for delivery when international rates are lowest and to batch them in ways that take advantage of lower bulk rates.

Conto said digital transmission offers higher quality, and the Group 4 software allows automatic error correction not possible with the analog Group 3 gear more commonly used.

In addition, Group 4 speeds are much faster than Group 3.

Tokyo Electric had not yet

been able to estimate the cost savings from sending fax as data, Conto said, but he pointed out that the method requires more advanced equipment, which at \$12,000 to \$16,000 per box is at least three times as costly as the analog equivalent.

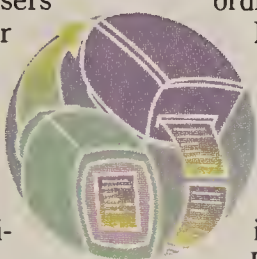
According to Larry Roberts, chairman and chief executive officer of NetExpress, Inc. in Vienna, Va., \$7 billion of the \$50 billion in annual long-distance carrier revenues comes from fax traffic sent as analog signals over ordinary telephone lines.

He said fax usage is growing at 30% per year and by the end of the decade will surpass first-class U.S. mail in the volume of information moved.

But Roberts, whose company sells digital fax products and services, said most firms have no idea how much they spend on fax because charges are buried in telephone bills. Moreover, few attempt to track those costs, he said. "They know the number of machines they have, but they don't know their [traffic] volumes or costs, and they haven't found a way to control costs. There is no fax czar."

Roberts said companies could halve the cost of sending a fax page — which averages 8 cents or more over ordinary telephone lines — by sending fax as data. The savings are especially dramatic when sending large volumes of fax overseas, he said.

Last fall, the New York State Division of Criminal Justice brought up a digital network linking 75 Group 4 fax machines



CMI, Xcellenet make strides in remote site capabilities

BY ELISABETH HORWITT
CW STAFF

Modern times have come to two vendors that specialize in coordinating data communications across branches of retail stores, banks and fast-food chains with hundreds or thousands of remote sites.

During the past year, rivals Corporate Microsystems, Inc. (CMI) in Lebanon, N.H., and Xcellenet, Inc. in Atlanta have been steadily enhancing their respective communications servers to provide a great deal more than just data collection and downloading to multiple remote

sites. In particular, the two vendors are targeting customers' migration of their remote sites from dumb terminals to intelligent desktop computers and local-area networks.

This eliminates branch offices' dependence on the central data center in order to do core transactions, according to Richard Villars, director of computer networking architectures at International Data Corp., a research firm based in Framingham, Mass.

"If you have your remote system tied in as a terminal and the network goes down, you lose

Continued on page 57

Over the hump

Estimates show 1992 to be a crucial year for fax modems to take off

	Units (in thousands)				
	1991	1992*	1993*	1994*	1995*
PC fax modems	750	2,278	3,008	3,948	4,490
LAN fax servers	12	28	53	102	178

*Projected

Source: BIS Strategic Decisions

CW Chart: Michael Siggins

Internal relief

Even if a user's fax leaves the premises over ordinary analog telephone circuits, there is much computer technology available internally to help relieve those lines at the fax machine. A \$100 add-on fax board can allow users to send a file to another fax machine without having to print it first, and some commercial electronic-mail services offer E-mail-to-fax options.

Even more helpful is having a fax server on a local-area network, so LAN users can send and sometimes receive faxes at their desktops. In addition to the cost of the dedicated PC, this will cost about \$1,500 for two boards and some software to serve a 15-person LAN, according to Judith Pirani, director of image communications at BIS Strategic Decisions in Norwell, Mass.

"It's like PCs," Pirani explained. "When PCs first came out, companies just plopped them everywhere and didn't worry about compatibility. The same thing has happened with fax machines. Now companies are looking at their phone bills, looking at people standing in lines to send faxes and saying there has to be a better way. That's where computer fax comes in."

The use of computer fax technology is exploding, she said.

at 60 sites using a virtual private data network service from New York Telephone Co. Used for transmitting fingerprints, mug shots, photographs of accident scenes and the like, the network has reduced the time it takes to send a fingerprint from 14 minutes, using old fax gear, to one minute.

According to a spokeswoman, the fax network equipment cost New York \$1.1 million but saves the state \$500,000 a year in operating costs.

Despite the high onetime cost, digital fax equipment used with a carrier-provided virtual private data network will increasingly be the solution of choice for large fax users, predicted Robert Rosenberg, president of Insight Research Corp. in Livingston, N.J.

"You can deploy across your [internal] network any number of fax servers and tie them into your virtual private network," Rosenberg said. "You're paying for a bundled service, not per call, so you might as well stack up faxes on the server, then dump them out as you would any other data traffic."

However, companies that

wish to take advantage of digital fax do not have to buy Group 4 gear or set up their own networks. The major carriers, including AT&T, MCI Communications Corp. and Sprint Corp., offer services that send customer fax traffic over digital circuits using store-and-forward technology. The carriers will maintain distribution lists for automatic fax broadcasting at predetermined times. For example:

- Miami-based Caribbean Communications Exchange uses AT&T's EasyLink to send information about new travel promotions to travel agents by broadcast fax. "Newsletters and mailers are not fast enough," said Robert Burke, chairman. "By using [the AT&T service], I'm able to capture the desks of 7,000 to 10,000 travel agents who specialize in the Caribbean."

- Bidnet in Albany, N.Y., uses its own computer network and MCI's Store-And-Forward-Exchange service to fax abstracts of government requests for proposals to its clients, a process that takes Bidnet a few minutes to transmit from its computer.

Everybody talks a in corporate America. some of th



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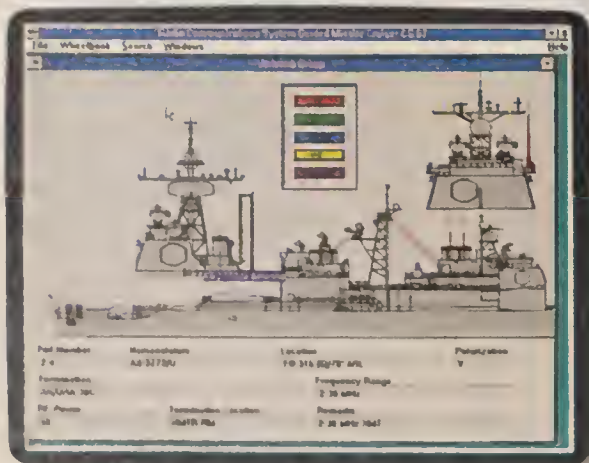
So if you're thinking about a PC-based solution for your company, and you'd like some additional information on the complete line of Microsoft® Windows development tools, give us a call at (800) 541-1261, Department HD3.

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CHEVRON

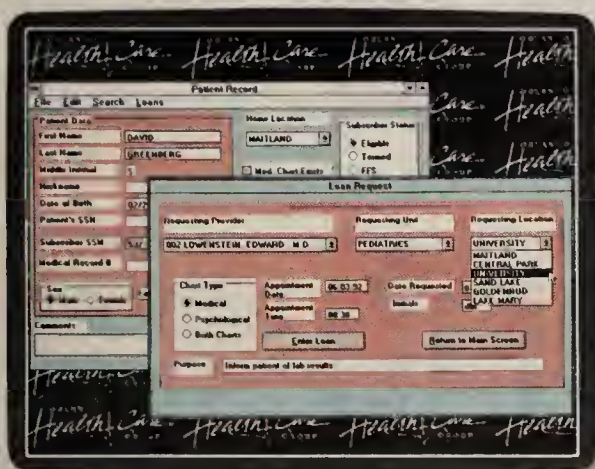
Chevron's LAN system clients asked for a PC-based corporate directory to give PC users a "phonebook" similar to the one on their mainframe. The problem was there was no solution on the market that could accommodate 45,000 records with 30 fields each. To solve their problem, they used Visual Basic™, MicroHelp Muscle for Visual Basic, VBTools, EditTool, ButtonTool, and Ramia Data Manager to create CLSctn for Windows. Now the users have an easy-to-use directory that allows them to access information by several different indexes.



U.S. NAVY

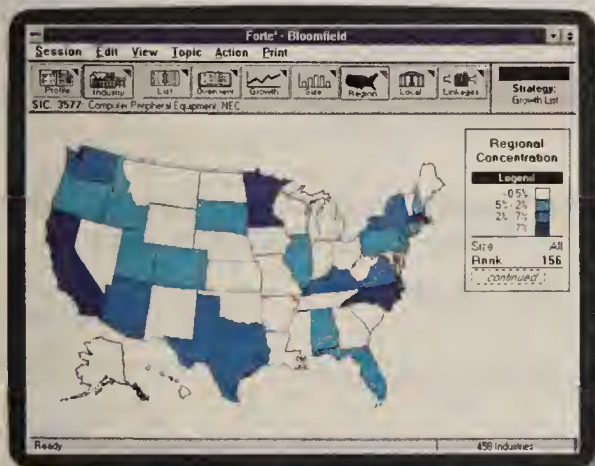
Navy ships were drowning in paper. The Chief of Naval Operations has estimated that it was costing \$400 million per year to store, access, control and update the vast amounts of required technical information. Using Microsoft C, the Windows SDK, Microsoft Word for Windows and Excel, they developed the Interactive Electronic Technical Manual. It allows them to store all of the volumes of technical information on a CD-ROM, which can be accessed with the click of a mouse.

about the problems We'd like to talk about the solutions.



ORLANDO HEALTH CARE GROUP

Orlando Health Care is a 52-physician practice providing HMO services at 6 medical facilities. They had a problem tracking and updating over 100,000 medical charts, because patients can receive services at any of the facilities. So they used Microsoft Visual Basic, Q+E™ Database Library, Microsoft SQL Server, Microsoft LAN Manager, and Select Comm Server to create the Master Patient Index, a systemwide database. The new system saves time and helps the company provide better quality health care.



PHH FANTUS

As an economic development consulting company, PHH Fantus analyzes enormous amounts of data. Some of their studies require the analysis of over 450 industries, and with the old manual system, it could take over 200 man-hours. To make their operation more efficient, they used Microsoft C, the Windows SDK and db VISTAIII Database Management system to design "Forté," a giant repository for data on a network server which is continually maintained and updated. Analysis that once took weeks now takes just hours.



ANSETT AUSTRALIA

As an airline, Ansett Australia needed to provide a better information system for its users. The old system forced users to wade through a large printed book for flight information. To solve this problem, they created the Ansett Travel Planner, with Microsoft Visual Basic, Windows SDK, Microsoft BASIC Professional Development System. Now it's much easier to update and access flight information. And there's a database that can store travel preferences for customers.



OTIS ELEVATOR

Senior Management needed a more accurate and timely way to consolidate all the financial information that was coming in from Otis companies around the world. So they used Microsoft C and Microsoft Excel along with Bridge Tool-Kit™ and Keyworks to create CFO, an executive information system. Now the analysts and executives can quickly access important data that'll allow them to spot and react to business trends.

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ROLM

A Siemens Company

Wexler

CONTINUED FROM PAGE 53

This is already happening in companies such as clothing manufacturer Byer California, where VPs need to see 5K-byte graphical representations of garments from wherever they darn well choose.

Unfortunately, high-speed carrier networks are not likely to satiate these users in the near future, industry observers acknowledge. This is because imminent services such as SMDS, frame relay and ATM are targeted first as inter-*site* linkages, not as portable, personal communications systems.

If you're into symbolism, you might view *U.N.C.L.E.*'s "D" communications channel as a foreshadowing to an ISDN-oriented answer to this. ISDN just happens to have an intelligent signaling (or "D") channel. Perhaps the age-old promise of broadband ISDN as a dial-up, high-bandwidth worldwide communications infrastructure will eventually come full circle after all. It's the closest thing in concept we have to ubiquitous access for nomadic users.

But progress is definitely afoot. Mitch Kapor, Lotus' founder, is now hard at work advocating a national everyone-to-everyone telecommunications infrastructure. (I wonder if *U.N.C.L.E.* was one of his favorite shows?)

Home address

Vendors and standards groups are also bringing solutions to the table for remote access into corporate internetworks that overcome addressing problems. For example, an IETF working group has tackled a project called Mobile IP, aimed to allow users to transport their computer's network address with them from segment to segment within a corporate internetwork.

On the vendor side, an innovative-sounding remote access product announced last week by Centrum Communications in San Jose, Calif., creates a proxy network that users can dial into from wherever they are, use temporary, floating addresses and bridge or route to whatever LAN segment they want. It is one of an avalanche of remote user-oriented products that have been flooding the industry recently.

In the meantime, though, these problem solvers are still hampered by a relatively slow public network that, because of the magic of television, just didn't get in Nappy and Illya's way 25 years ago.

Or do you think it was because they only ran voice applications?

Wexler is a *Computerworld* senior editor.

Politics threaten debut of communications tools

BY JAMES DALY
CW STAFF

NAPA, Calif. — Governmental inertia could choke the burgeoning potential of a new range of lightweight communications products, warned experts gathered at a communications conference held here recently. They urged the Federal Communications Commission to move quickly to ensure the U.S.' place in the world market.

The arrival of personal electronics such as wireless lightweight computers, interactive newspapers and technology such as video on demand, depends on allocating the limited number of available radio frequencies among new and existing communication services swiftly and efficiently. These are two qualities the government is not known for, conference attendees complained.

"We're at risk as a nation of losing our competitive edge," said William Hilsman, a former top Pentagon communications

expert who now heads International Mobile Machines Corp., a supplier of wireless digital access products in King of Prussia, Pa.

The key limiting factor facing the growth of these markets is not the availability of enabling technology but the allocation of the appropriate spectrum needed to support the market.

Costs of delay

The FCC, which oversees such spectrum allocation, has a reputation for dragging its feet, and that could prove costly to U.S. manufacturers.

Charles L. Jackson, a member of the National Economic Research Association in Washington, D.C., claimed that an 11-year delay in the FCC's approval of cellular communications cost U.S. vendor companies \$86 billion.

Thus far, however, signs have been more positive. For example, the FCC recently voted to release 220 MHz of radio spectrum for "emerging technol-

ogies," a move that would displace utilities, railroads and others that have long used those frequencies for microwave communications. The FCC also plans to allocate 20 MHz of radio spectrum for use in wireless networks. The plan is tentative, pending receipt of public comment.

A snag has already developed, however. Sen. Ernest Hollings (D-S.C.) has sponsored an amendment to the FCC bill that would allow those companies that are to be stripped of their frequencies to keep their portion of the spectrum for another 15 years — a move that FCC chief engineer Thomas Stanley said could significantly delay the introduction of the new communication service.

Some vendors and other experts said they feel that unless the U.S. moves quickly to continue efforts to allocate spectrum for these emerging technologies, several potentially large markets could be lost to competitors in Europe and Japan.

Aggressive spectrum allocation activity by regulatory bodies in Europe and Japan are giving America's competitors a head start in the race for these markets.

"The U.S. isn't going to lead the way if the various parts of the communications industry continue to bicker over how to slice the pie," said Gilbert Amelio, president of National Semiconductor Corp., which sponsored the two-day Communicating The Future conference.

Opportunities abound

The shift of communications services over to digital could present multibillion-dollar opportunities to many companies. Earlier this year, Apple Computer, Inc. Chairman John Sculley described a "personal digital assistant" called Newton that could sport radio-based communication services.

In addition, once TV signals are sent in digital format, networks might transmit electronic data services such as stock quotes or deliver on-demand motion pictures in just a few seconds over high-capacity fiber-optic wire, predicted Nicholas Negroponte, director of MIT's Media Lab.

"The next step in TV is not being high-definition, it is being digital," he said. "The people who don't think about it in that way are going to become part of the road instead of part of the steamroller."

Firms' remote site strides

CONTINUED FROM PAGE 53

your ability to do point-of-sale [transactions]," he said.

Both CMI and Xcellenet originally sold communications servers that could be programmed to automatically collect information from, or download information to, remote systems.

CMI's Mlink Advanced Communication Manager and Xcellenet's RemoteWare Communications Management System are used to poll thousands of fast-food restaurant branches for sales and inventory updates and to download price changes.

Smarter sites

However, the recently revamped products now do a lot more than upload and download, with many of the added capabilities geared to taking advantage of the expanding computer intelligence out at the branches.

Both products, for example, can now be programmed to distribute software to remote sites. Xcellenet's RemoteWare is said to support the creation of forms at the central site, which can then be distributed to remote sites for a fill-in-the-blanks query. This is a function that customer Friendly Ice Cream Corp. is looking to leverage soon [CW, Aug. 10].

Both vendors can now orchestrate communications among remote sites; for example, they can act as electronic-mail post offices for remote us-

ers. CMI has just added an application programming interface that enables the server to directly support popular E-mail applications, according to CMI President Theo Pozzy. A new version of Mlink, due to ship in September, will support a gateway to Lotus Development Corp.'s CC:Mail, he added.

Also available with the new Mlink release is the ability to interact with LAN nodes via Transmission Control Protocol/

Internet Protocol, Pozzy said.

Xcellenet recently announced RemoteWare Version 1.4, which is said to use enhanced data compression to support speeds of up to 57.6K bit/sec. over a dial-up, V.32 modem. Formerly, the top speed was 19.2K bit/sec.

RemoteWare 1.4 is also said to route data to LAN nodes via the NetBIOS transport protocol.

Added support

The latest release of RemoteWare also supports Apple Computer, Inc. System 6.0 and System 7, AT&T Unix System V and IBM AIX remote nodes.

Injunction halts Hayes' disk distribution

BY JOANIE M. WEXLER
CW STAFF

Modem pioneer Hayes Microcomputer Products, Inc. was recently served a temporary court injunction that prohibits the company from sending test disks to other vendors' customers to help them ascertain if their devices' escape sequence mechanisms are Hayes-compatible.

The injunction was prompted by complaints from rival Multi-Tech Systems, Inc. in Mounds View, Minn., about Hayes' advertising and educational programs, which instruct users how to determine whether modems use Hayes' 11-year-old escape sequence. Multi-Tech charged that the moves were hurting its business.

The injunction expires today, although Multi-Tech said it intends to ask the court to extend the restraining order until an as-yet-unscheduled court date.

Separately, Sierra Semiconductor Corp. in San Jose, Calif., has filed a false advertising and unfair business practices suit against Hayes, alleging "inflammatory and improper" advertising. The suit aims to force Hayes to cease running the escape sequence-oriented ads.

Escape plan

Hayes' escape sequence allows modems to differentiate between data that a user intends to transmit and commands intended for the modem itself. Without it, modems can interpret data as commands and break a transmis-

sion, Hayes spokeswoman Peggy Ballard explained.

Multi-Tech is one of a few modem vendors that have not licensed Hayes' patent on the mechanism. Company spokesman Paul Kraska said the firm challenges the patent's validity on the grounds that the scheme existed long before Hayes' implementation. Multi-Tech does not intend to pay license fees for a noninvention, he said.

For now, Hayes may continue advertising and sending out information to interested customers. But it is temporarily prohibited from issuing data disks with a sequence of ASCII characters that, when transmitted, would prove the tested modems either compatible or incompatible with the Hayes mechanism.

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1992 Computerworld Editorial Calendar (July-December)

Issue Date	Ad Closings Color* B/W		Editorial Feature	Show Distribution	Ad Readership Issue	Response Card Decks
July 6	June 19	June 26	Product Spotlight: X Terminals Buyers' Scorecard: Integrated Image Processing Software		Starch Study	
July 13	June 26	July 3	Executive Report: LAN Maintenance: Who is Minding the Store?			Mails: July 15 Space Close: June 5 Mat'l Close: June 8
July 20	July 3	July 10	Product Spotlight: New Generation of Word Processing Software Buyers' Scorecard: Object-oriented Programming Software	Communication Networks West & Object World July 21-23, San Francisco	Starch Study	
July 27	July 10	July 17	Executive Report: Workgroup Computing Group(ware) Therapy: Making Workgroups Work			
Aug. 3	July 17	July 24	Product Spotlight: Inventory Management Software Buyers' Scorecard: Full Life-cycle CASE			
Aug. 10	July 24	July 31	Industry Closeup: IS in Banking Executive Report: Downsizing/Rightsizing	Windows OS/2 Aug. 12-14, Boston	Starch Study	Mails: Aug. 12 Space Close: July 3 Mat'l Close: July 6
Aug. 17	July 31	Aug. 7	Product Spotlight: Peripherals for Travel (portable modems, printers, docking stations) Buyers' Scorecard: Large-capacity Mainframes			
Aug. 24	Aug. 7	Aug. 14	Executive Report: The New Spinoffs			
Aug. 31	Aug. 14	Aug. 21	Product Spotlight: The Latest in Frame-Relay Products and Services Buyers' Scorecard: Virus Detection Software		Starch Study	
Sept. 7	Aug. 21	Aug. 28	Special Report: Annual Salary Survey			
Sept. 14	Aug. 28	Sept. 4	Special Report: Annual Job Satisfaction/Job Performance Survey Special Supplement: Annual <i>Premier 100</i> Magazine		Starch Study	Mails: Sept. 16 Space Close: Aug. 7 Mat'l Close: Aug. 10
Sept. 21	Sept. 4	Sept. 11	Product Spotlight: Mainframes Buyers' Scorecard: Large-Capacity Mainframes	TCA Sept. 21-26, San Diego		
Sept. 28	Sept. 11	Sept. 18	Executive Report: Ensuring Data and Information Quality			
Oct. 5	Sept. 18	Sept. 25	Product Spotlight: EDI Products and Services Buyers' Scorecard: Disk Arrays			
Oct. 12	Sept. 25	Oct. 2	Integration Strategies: Integrating New Development Tools Industry Closeup: IS in Biotechnology	Networld Oct. 13-15, Dallas	Starch Study	Mails: Oct. 14 Space Close: Sept. 4 Mat'l Close: Sept. 7
Oct. 19	Oct. 2	Oct. 9	Product Spotlight: Project Management Software Buyers' Scorecard: Electronic-Mail-Enabled Applications			
Oct. 26	Oct. 9	Oct. 16	Special Issue: Annual <i>Campus Edition</i> Executive Report	Interop '92 Oct. 26-30, San Francisco PC Expo Oct. 27-29, Chicago		
Nov. 2	Oct. 16	Oct. 23	Product Spotlight: Work-flow Software Buyers' Scorecard: PC Graphical User Interfaces		Starch Study	
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Nov. 16	Oct. 30	Nov. 6	Product Spotlight: Best Buys in 486 PCs Buyers' Scorecard: 33Mhz 486 PCs	Comdex Fall Nov. 16-20, Las Vegas	Starch Study	
Nov. 23	Nov. 6	Nov. 13	Integration Strategies: Rise of the Specialist Integrator Industry Closeup: IS in Retail			
Nov. 30	Nov. 13	Nov. 20	Product Spotlight: Downsizing to Minicomputers Buyers' Scorecard: Midrange Systems (10 MIPS and higher)		Starch Study	Mails: Dec. 2 Space Close: Nov. 6 Mat'l Close: Nov. 9
Dec. 7	Nov. 20	Nov. 25	Executive Report			
Dec. 14	Nov. 25	Dec. 4	Product Spotlight: Windows Utilities Buyers' Scorecard: DASD		Starch Study	
Dec. 21	Dec. 4	Dec. 11	Executive Report			
Dec. 28 & Jan. 4,	Dec. 11	Dec. 18	Special Edition: Annual Forecast Issue			

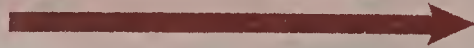
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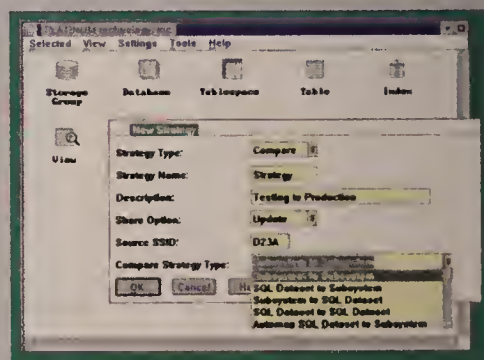
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Growth path is key for 5995M buyers

Amdahl's high-end mainframe line wins backing as early users move to consolidate data centers

BY JEAN S. BOZMAN
CW STAFF

The first wave of users who installed Amdahl Corp.'s 5995M processors said they chose their machines to help consolidate data centers and to expand to the line's larger models in stages.

Several users reported that they had installed Amdahl's newest processors with an eventual upgrade to the eight-way model's 311 million instructions per second processor in mind.

The 5995Ms, which have been shipping since December, are Amdahl's answer to IBM's Enterprise System/9000 series and run IBM systems software.

As such, they are bid directly against IBM's machines and often against Hitachi Data Systems Corp.'s GX series processors. But it is the range of Amdahl's product line that most recent buyers said had influenced them.

Piece by piece

While IBM has been shipping its ES/9000s since late 1991, it has not announced its eight-way machine, which is expected in 1993. Even so, a 90-day delay in shipments of the six-way and eight-way Amdahl machines — originally scheduled for the second quarter — caused some sites to take their high-end models in

two pieces.

"We are anticipating growth, and we are constantly reforecasting our [computing] needs," said Guy Battista, a vice president who manages the data center at Integrated Systems Technologies Corp. (IST), a Medford, Mass.-based subsidiary of First Data Corp. in New York.

The company had two IBM mainframes as well as an Amdahl machine before it installed a 5995M Model 3550 in March, and an upgrade to a six-way machine is already scheduled for this fall, according to Battista.

One advantage to having all IST applications running on one big Amdahl mainframe will be the ability to shift memory partitions as needed.

"It gives us more flexibility," Battista said. "If we had a need for more computer resources, I could borrow them from our test environment [partition]. When we had separate CPUs, I couldn't do that."

The University of Texas at Austin installed a 5995M Model 4550 in late June, displacing an IBM ES/9000 Model 720. Demand for computing at the 50,000-student university was outstripping the school's ability to install new mainframes, said Randy Ebeling, director of data processing. He said he sees the 5995M Model 4550 as a way to upgrade in stages.

"Our systems do millions of calls to the [Software AG Adabas] database a day. We have 1,350 users, and our need for computing capacity is doubling

Amdahl 5995M

Announced: September 1990.

Shipped: December 1991.

Compatibility: IBM ES/9000 series mainframes.

Models: Versions ranging from three processors to eight. Six- and eight-way processors will ship in the third quarter.

Cycle time: 6.5 nanoseconds.

MIPS range: 142 MIPS (3550M) to 311 MIPS (8650M).

Price range: \$14.2 million to \$30 million.

User comment: "The Amdahl [5995M] Model 4550 we installed has 50% more capacity than the IBM ES/9000 Model 720 that it replaced, and we expect that we'll have to upgrade it again in a year." *Randy Ebeling, University of Texas*

Performance and prices do not include Amdahl's Enhanced Performance Feature.

CW Chart: Michael Siggins

hundreds of on-line users during the day and runs batch processing at night.

The University of Texas' machine is very new, but no major problems have cropped up so far, Ebeling said.

Industry analysts said they believe Amdahl is willing to discount heavily to displace many high-end IBM systems [CW, Aug. 10]. Amdahl reportedly lent many of its older 5995A mainframes as "place holders" to hold data center space for the 5995Ms, several analysts said.

"Amdahl is trying to gain footprints in key strategic accounts and is willing to sacrifice some margins to get those footprints," said Mark Hess, vice president at Gartner Group,

Inc.'s Large Computer Strategies Group. "It's not uncommon to see discounts beyond 50% from Amdahl."

Important step

"The vendors all believe it's a kind of annuity," Hess said. "Once you get the footprint, you've got all the subsequent upgrades, the memory and channel upgrades, and the maintenance and service for several years."

He estimated that Amdahl shipped between 50 and 75 systems in the first two quarters of 1992. That compares with International Data Corp. estimates of more than 200 Amdahl machines shipped worldwide in all of 1991.

Special features of the 5995M machines are often part of user decisions to install Amdahl computers, users said. Among these is a "concurrent" maintenance feature, which downloads microcode changes in 800 msec or less, allowing mainframes to keep running during an upgrade.

Business forms maker eyes client/server plan

BY JOHANNA AMBROSIO
CW STAFF

DAYTON, Ohio — The Standard Register Co. has embarked on the client/server trail with a multimillion dollar order-entry project. In this case, the server will be the firm's mainframe.

The application, when com-

pleted in two years, will run under IBM's OS/2 Version 2.0 on personal computers in the 50-plus sales offices and send information back to the corporate IBM Enterprise System/9000 Model 480 mainframe for processing, delivery and billing.

Standard Register, a 6,000-

Continued on page 65

ON SITE

Standard Register Dayton, Ohio

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Mainframes not a disappearing act yet

CONTINUED FROM PAGE 1

processors dedicated to functioning, for example, as communications or database servers.

In this scenario, mainframes five to 15 years out will store and switch around data and information that is actually processed by desktop computers, and the bulk of the corporation's applications will reside on personal computers or local-area networks — in short, what mainframe kingpin IBM calls cooperative or distributed processing.

Future uses of mainframes will also focus on serving functions such as backing up LANs, distributing software changes and upgrades to LANs and track-

ing the comings and goings of all the other machines. Still, the mainframe will be only one entity among many on the network.

Mainframe vendors, particularly IBM, will respond to these changes both with a stepped-up price/performance curve and the addition of new technologies to the big iron, including special-function processors, massively parallel machines and other features intended to give users a continued reason to believe in big iron (see story below).

Users will continue to buy mainframes, although fewer in number and larger in size, analysts said. Specific long-term

purchase strategies vary according to the user (see story next page).

Many users are aggressively moving applications off the host system in an attempt to either cap mainframe spending or take advantage of newer computing platforms including workstations — or both (see chart). But this swirl of activity sounds no death knell for the mainframe or for the billions of dollars invested in associated systems and applications software.

"The dinosaur is alive and well," said George Sekeley, president of CSX Technology in Jacksonville, Fla.

Still, there are several important differences between what is shaping up as the computing environment of the 1990s and what has come before. Among them are the following:

- The new mantra is to let the application dictate the best platform. Just as there is no universal answer within one large organization, the answers vary widely from shop to shop. "In years past, the mainframe was the only choice," said Ira Morrow, vice president of Shearson Lehman Brothers, Inc. in New York. "Now we have many possibilities, and we want to choose the right target for the right platform."
- The movement to-

ward open systems means that many customers are looking for "open" options. Most users do not see the traditional mainframe falling into the open camp, although recent mainframe-class product introductions by NCR Corp. and Hewlett-Packard Co. may motivate the traditional

end of the decade, and that there will likely be some applications — airline reservations systems and banks' customer information systems being the most-often-cited examples — that will not move off the mainframe for many years.

These users are quick to warn about the shortfalls of downsizing as well [CW, Aug. 10]. "Where it makes sense to offload, we will," said Ken Nelson, vice president of MIS at Reader's Digest Association, Inc. in Pleasantville, N.Y.

"But until I see the client/server platform providing equivalent stability, performance, consistency and reliability to the mainframe, it's just not where I'm comfortable putting my mission-critical applications."

At Reader's Digest, the main mission-critical applications include customer service and direct marketing.

The cost benefits of nonmainframe platforms, however appealing at first blush, may

be deceptive. "I don't believe organizations do proper costing of alternative platforms," said John Randolph, a member of the Management Board of Cabinet in Ontario. "People don't admit to how much money is really being spent. You have to look at the total cost of service and support; the hand-holding requirement is much greater for the alternative platforms."

For example, Randolph said, one of the Canadian government agencies asked for approval to

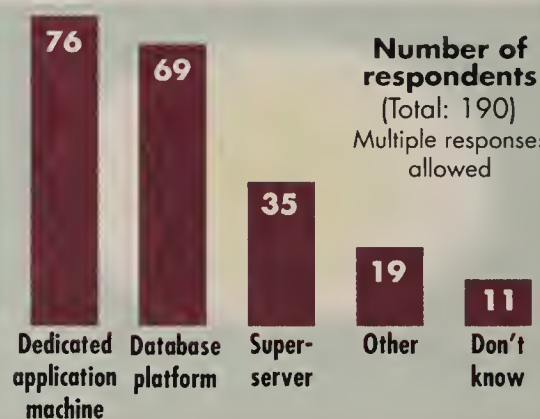


CSX Technology's Sekeley says the dinosaur lives

Changing roles

The mainframe is evolving into a different type of processor

What role will your mainframe play by 1995?



Source: CW Database Division

CW Chart: Janell Genovese

"big-box" vendors to more quickly incorporate standards into their systems.

Too good to pass up

• IS executives are finding the lower costs for nonmainframe platforms to be compelling, and they are selecting them where appropriate. However, most large corporations still do not trust their core, bet-the-business applications to anything but a mainframe. Many IS executives said they do not see that trend changing much before the

Big iron adapts to avoid going the way of the dinosaur

Big iron doesn't usually mean big changes. But these "dinosaurs" aren't standing still: In the next five to 10 years, mainframes are expected to be smaller, much less expensive and made up of a series of interconnected, specialized processors, as well as to feature more characteristics associated with "open" systems.

Within 15 years, perhaps sooner, today's top-of-the-line IBM machine will evolve into a massively parallel computer. Today's list price for an IBM mainframe is about \$100,000 per million instructions per second (MIPS); discounting brings the price to about \$60,000 per MIPS. Five or so years from now, analysts said, the per-MIPS price will have to drop to about \$15,000 to be competitive.

Bill Wilson, assistant general manager at IBM's Enterprise Systems line of business, agreed that mainframes will become much less expensive during the next five years. Traditionally, he said, mainframes have followed a price/performance improvement curve of 15% to 18% per year. That will double during the next five years, he said.

One way vendors will make the mainframe less expensive to manufacture, and hence to sell, is by bringing new kinds of chips into the machine architecture.

Some analysts, such as Frank Gens at Technology

Investment Strategies Corp. in Framingham, Mass., said they expect the mainframe complex to be front-ended by the reduced instruction set computing (RISC) chips IBM uses in the RISC System/6000.

Along the way, Gens said, IBM will "open" the mainframe architecture by injecting its AIX Unix-like operating system into MVS and vice versa.

Other analysts, such as Jay Stevens, senior vice president at Dean Witter Reynolds in New York, said they expect to see by mid-decade a switch from the current 32-bit bipolar chips to less expensive but more powerful 64-bit, proprietary bi-CMOS semiconductors.

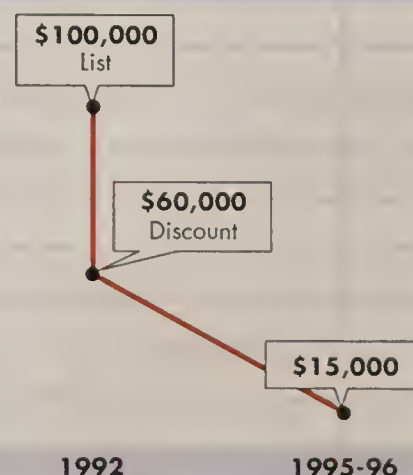
In the meantime, IBM will introduce its eight-way processor later this year, Wilson confirmed. IBM will continue to evolve its Sysplex, or "systems complex," which connects multiple microprocessors and makes

them appear and act as a single unit. The software for this is expected to be ready by 1994, and some of the hardware is already shipping.

Free-fall

The cost of mainframe MIPS is expected to decline 85% during the next few years

Average price per MIPS for IBM mainframe and compatible systems



Source: Gartner Group, Inc.; Dean Witter Reynolds

Sysplex will be the basis for the so-called "Planet" complex, which Stevens said he expects will be introduced in 1995 and will ship the next year. Planet will include parallel processing for database functions and special-purpose processors for handling I/O, memory management and other tasks. Performance for the total complex will likely be 2,000 MIPS.

IBM competitors Amdahl Corp. and Hitachi Data Systems Corp. are also exploring similar technologies.

Relatively speaking, the hardware will be the easy part, observers said. IBM already has prototypes running in the laboratories with 50 or so processors linked, according to Wilson.

JOHANNA AMBROSIO

move an application from a service bureau to an in-house Digital Equipment Corp. minicomputer and attached PCs. The agency requested 11 staffers to support the application: three for VAX hardware and software support and eight for the PCs.

"The smaller platforms are much more people-intensive; the handholding requirements are much greater," Randolph said. "And the life span is not as long."

Then there is the issue of semantics. "What's a mainframe these days?" asked Herbert Yarbrough, a senior IS analyst at Duke Power Co. in Charlotte, N.C. "You have to talk about how computers are used. We treat some Unix boxes as mainframes. If we put them in the glass house, support them with a programming staff and end users

can log on and gain corporate-wide information access, you can call it a mainframe."

Other users agreed that the definition of the mainframe is in flux, moving away from how many users it supports or how many instructions it processes, and toward a more functional view of what the machine does.

Even IBM is shying away from the classic definition. Bill Wilson, assistant general manager in IBM's Enterprise Systems line of business, spoke about "large systems that manage very large work loads better

than very small systems." He defined "large work loads" as applications worked on by more than 25 simultaneous users that require several hundred gigabytes of data and tens of thousands of transactions per hour. He said a recent IBM survey of over 1,500 customers in the U.S., Europe and Japan showed that half of users' IS budgets "will be on something called large systems."

Wilson agreed, though, that the mainframe's role is changing. IBM and other large systems providers, including Amdahl Corp. and Hitachi Data Systems Corp., are positioning the mainframe as the integrator of the customer's total environment.

"If we execute well and make it easy for customers to manage that complex environment, then there's a growth market," Wilson said.

Other reasons the mainframe will not disappear overnight have to do with the human factor and because change usually takes longer than expected. Thomas Nies, chairman of Cincom Systems, Inc. in Cincinnati, said, "The investments we've made become an impediment to what we can do. But the major barriers are closed minds, not closed systems."

Next week, Computerworld will look at the impact of downsizing on mainframe programmers.



Joyce Ravid

Nelson: *Reader's Digest will offload 'where it makes sense'*

Strategies for mainframe purchases

Users are taking various approaches to their mainframe purchase plans 5 to 10 years out. Some will continue to buy big iron, although they may consolidate the number of mainframes along the way; others are capping large systems purchases and downsizing, although they will retain their existing mainframes.

Still others are aggressively downsizing to get rid of as many mainframe applications they possibly can.

The following is a sampling of mainframe purchase plans at five large organizations:

• Capping mainframe growth.

Robert Delaney, vice president of the Principal Financial Group in Des Moines, Iowa: "Our mainframe is still growing, but we're trying to move into a client/server environment so the mainframe will grow less quickly. We haven't really figured out who will win on the desktop — OS/2, Windows or DOS."

Herbert Yarbrough, senior IS analyst at Duke Power Co. in Charlotte, N.C.: "We're spending as few dollars on the mainframe as we can, and we're moving processing cycles off to less expensive platforms. We're hoping not to have to grow the mainframe anymore, but I don't see it going away. We will continue to go to the mainframe for data."

• Still buying mainframes.

Ron Waid, technical director of host and capacity planning at The Travelers Corp. in Hartford, Conn.: "Our applications areas are not moving quickly to distributed architecture. Our mainframe MIPS will continue to grow at 10% to 15% for a while.

A lot of the new development is taking place off the mainframe, but we're certainly not stopping mainframe development. We haven't been able to stop and say, 'No more mainframes.'"

David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh: "We're sorting out where to move what applications. We move 5 million checks each night through the system, and there aren't a lot of choices there. Our mainframe capacity has grown 18% to 20% per year, although it's begun to tail off this year."

• Aggressively downsizing.

Bill Dean, director of technology management services at PepsiCo, Inc. in Purchase, N.Y.: "There has not been one

major system under development on a mainframe for at least a year. Our mainframe growth rates plummeted to 15% per year through 1988, and we went from 2,000 to 16,000 PCs. Then we started to see another decline to around 8% per year."

JOHANNA AMBROSIO



George Ceolla

Delaney: *Seeking to slow mainframe growth at Principal Financial*

Empress RDBMS adds cross-platform functionality

BY MELINDA-CAROL BALLOU
CW STAFF

GREENBELT, Md. — Empress Software, Inc. will release a new version of the company's Empress relational database management system at Unix Expo next month that will offer distributed database capabilities across heterogeneous platforms, officials said.

Version 6 of Empress will initially be available for Cray Research, Inc., Silicon Graphics, Inc., Hewlett-Packard Co. HP 9000/400 series and Sun Microsystems, Inc. workstations and personal computers running Interactive 386IX.

It will be generally available on other Unix platforms in January and on Digital Equipment Corp. VMS and MS-DOS systems by midyear allowing users to access data across the network, officials said.

The translations required to access data interactively across platforms will be accomplished by the Empress RDBMS so that end users will be able to access data transparently, according

to officials.

"Version 6 will offer a translation layer on top of our DB Server, which will handle dissimilarities across hardware architectures, the most important of which is that between 64-bit [Cray systems] and 32-bit engineering workstations," said Rich Grohol, a regional sales manager at Empress.

Empress' DB Server lets users make queries from remote nodes across the network. The DB Server handles load balancing and can fire up subprocesses that can run on separate processors. Users can therefore have multiple DB Server processes running on each node of the network, and those nodes can each have multiple servers and multiple clients.

Taking full advantage

"This is important for load balancing across the network so that users can take full advantage of their computing power and so that not all the queries are going through a single server on a single node on the network," Grohol said.

Industry analysts said the Empress database offers support for true variable-length binary large objects (BLOB), which can be indexed and manipulated by users, and the RDBMS primarily targets markets that do not require high transaction rates.

Empress is "more oriented toward scientific and engineering or other applications where there's a low chance of concurrent access and where you want to see data distributed and updatable across multiple servers," said Rich Finkelstein, president of Performance Computing, a market research firm based in Chicago.

Empress Version 6.0 will also take advantage of shared memory and shared libraries of the various systems so the time required to set and release locks can be reduced, Grohol said.

Users said they were attracted to Empress as a result both of its support for BLOBs and its distributed potential.

The upcoming distributed capabilities of Empress "are very important, and that's one of the reasons we chose it," said Bryan

Williams, manager of device research operations at Colsa Corp., a computer systems and engineering company based in Huntsville, Ala. "We have all kinds of distributed experiments running on multiple vendor platforms — as many as 15 or 16 for one experiment, for instance."

The distributed capabilities of Version 6.0 of the Empress RDBMS will also be used for the U.S. Navy's \$250 million Primary Oceanographic Prediction Systems (POPS). The RDBMS will be offered through Grumman Data Systems Corp., based at the Stennis Space Center in Mississippi, to the U.S. Naval Command. The POPS program uses Empress to distribute information across Cray supercomputers and other Unix workstations.

"Our first goal is to get out of proprietary systems and home-grown data management methods to move into a more robust world that's maintainable, distributed and not proprietary," said Randy Nottenkamper, POPS site manager in Monterey, Calif.

IN BRIEF

Ross makes Promix sales

■ **Ross Systems, Inc.** announced recently that it had sold about \$6 million of its Promix process manufacturing system and related services. The system is headed for use at such customers as Du Pont Co., Monsanto Chemical Co. and Moyer Packing Co.

■ **Cray Research, Inc.** has unveiled plans to integrate the Ingres relational database management system onto its entire line of Cray Y-MP supercomputers. Ingres, from the Ingres Products Division of The Ask Cos., operates on about 40 platforms, with Cray at the high end.

■ **Applied Data Processing** will incorporate PeopleSoft, Inc.'s client/server human resources software into its turnkey applications, the companies announced earlier this month. PeopleSoft's financial software is not included in the agreement.

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Business forms maker eyes client/server plan

CONTINUED FROM PAGE 61

employee, \$700 million manufacturer of business forms, hopes to decrease the lag time between when a customer places an order and when the order is completed, according to Tom McGoldrick, director of information services. The goal is to reduce the time from 30 to 24 days.

"One of the key things we've realized is that salespeople should be selling, not coming back to the office and doing paperwork," McGoldrick said. "This will cut down on administrative overhead time, increase service levels to the customers and reduce the inventory in warehouses." He estimated that the project, called Strategic Technical Resource Assistance (Star), will pay for itself within two years.

Marty McDevitt, a business-forms industry analyst at Cleary Gull Reiland & McDevitt, Inc. in Milwaukee, said Standard Register wants "to remain one of the most competitive firms in the industry, and they want to compete on the basis of service. It's another way for the sales force to be more efficient."

Eventually the client/server technology will be extended to other applications, McGoldrick said. "We're being very careful to select the technology because it will be used for other applications," he said. For example, graphical user interfaces will be built onto the company's order-entry and distribution systems.

Relational core

Although McGoldrick was reluctant to detail specifics of the application because of its proprietary nature, he did discuss some of the technology Standard Register will employ. At the heart of Star will be Cincom Systems, Inc.'s Supra relational database.

Application development tools will include Applications Manager from Intelligent Environments, Inc. and AD/Advantage from Cincom. The 20-person development team will complete a prototype by November, with production roll-out scheduled in phases over two years, according to Barbara Whitney, Star's development director.

"It's really a technology prototype as well as an application prototype," Whitney said. "A lot of the products we'll be using are very new, and some won't even be out until the third quarter."

The OS/2 performance monitor and tape backup systems are available for Version 1.3 of the operating system but not yet for Version 2.0. Therefore, the company will be testing these new products as well as trying to incorporate them into the order-entry application.

Standard Register already has roughly 750 PCs in its sales offices, although some may have to be replaced to handle the new application. No decision has been made on the type of PC that would be chosen.

"When we roll it out, we want each PC to have a standard configuration so we can manage everything from Dayton," Whitney said. "Where possible, existing workstations will be rolled in, but they will have to meet the compatibility requirements."

NEW PRODUCTS

System software

BMC Software, Inc. has started shipping Batch Control Facility.

The product offers a fast way to log IBM IMS batch jobs to buffered tape devices and automates the log closure process. It also reports on batch performance statistics that can be used in application tuning and capacity planning.

Pricing starts at \$11,500.

BMC Software
Suite 320
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77478
(713) 240-8800

BGS Systems, Inc. has announced Release 2.0 of the Best/1-Datcenter software package.

The product was designed for performance analysis, tuning and capacity planning of MVS and VM systems. System performance data is used to construct graphical representations of a data center's principal work loads, hardware configurations and performance variables. Users can estimate the performance impact of work load growth.

Pricing is from \$40,000 to \$100,000.

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BUYERS' SCORECARD

Adabas stays one step ahead

BY DEREK SLATER
CW STAFF

Software AG of North America, Inc.'s Adabas received the highest user satisfaction ratings in *Computerworld's* Buyers' Scorecard on mainframe relational database management systems for the second straight year.

Adabas earned an overall satisfaction score of 78, up from 72 last year [CW, Feb. 25, 1991]. Users indicated that Adabas' strengths — in areas such as system availability and recovery from crashes and performance in on-line transaction processing — are more important than its limitations.

Adabas is structured as an inverted list database that provides associative access to data based on special indexing procedures. SQL queries must be translated internally by Adabas.

"It can be extremely fast in on-line transaction processing," says David McGovern, an analyst at Alternative Technologies, Inc. "If you're trying to do relational queries, that's not necessarily its strong point."

Adabas also scored high in the area of vendor service and support.

The overall order of finish closely mirrors last year's survey results. Adabas was again followed by Oracle Corp.'s Oracle, which provides a different set of strengths.

Oracle rose to industry prominence on the relational name tag, and its highest marks in the survey came in support for standard SQL and useful SQL extensions.

Oracle's final score of 76 was sev-

en points higher than last year's tally. However, it finished back in the pack in several important categories, including performance in on-line transaction processing and providing effective user-defined data integrity.

Computer Associates International, Inc.'s CA-Datcom tied with Oracle for second place. CA-Datcom has added SQL support and relational functionality in its most recent release, Version 8.0 (and is thus termed "born again" by relational gurus). Users rated it above its competitors in vendor service and support, while it suffered lower scores in integration of DBMS and operating system security and in decision-support applications.

The runaway market share leader, IBM's DB2, finished fourth with an overall score of 73, followed by Cincom Systems, Inc.'s Supra at 72 and IBM's SQL/DS at 71.

IBM's tandem products finished second and third in support for standard SQL but dropped to the last two places in performance in on-line transaction processing.

DB2 users noted in verbatim responses that the product is solid and reliable but that it tends to place high demands on system memory and processing power.

Supra scored well in performance and data integrity areas but finished with one of the lowest scores in vendor service and support.

The survey measured users' satisfaction with their installed products. Users rated only their own products on a scale of 1 to 10 in 15 specific categories. See the methodology on the next page for a description of the scoring process. •

Mainframe RDBMSs

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 40 users per product, except CA-Datcom (30) and Oracle (28).

Total possible score

100

Mean score

74

Product	Highest ratings	Lowest ratings
Software AG's Adabas SCORE 78	Vendor service and support System availability and recovery	Useful SQL extensions Support for standard SQL
Oracle's Oracle SCORE 76	Support for standard SQL Useful SQL extensions	Vendor service and support Performance and system monitors
CA's CA-Datcom SCORE 76	System availability and recovery On-line transaction processing performance	Integration of CASE tools Performance and system monitors
IBM's DB2 SCORE 73	Effective programming tools System availability and recovery	Performance and system monitors Integration of CASE tools
Cincom's Supra SCORE 72	System availability and recovery On-line transaction processing performance	Performance and system monitors Distributed updating and recovery
IBM's SQL/DS SCORE 71	Support for standard SQL Distributed updating and recovery	Performance and system monitors Effective end-user tools

KEY RATINGS

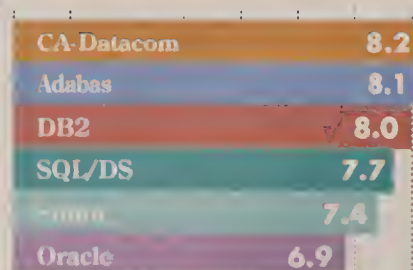
Adabas placed first or second in the six categories that users rated most important.

User importance rating:

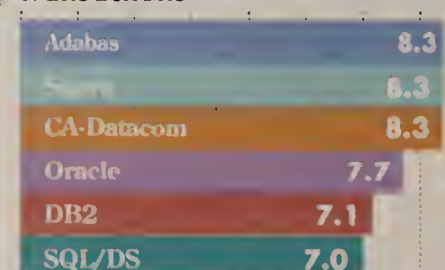
9.5 System availability and recovery from crashes



9.0 Vendor service and support



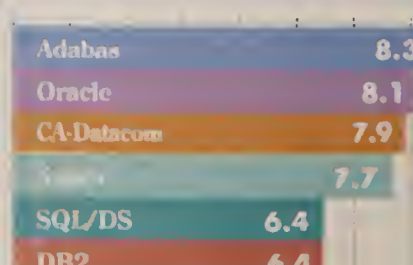
8.8 Performance in processing on-line transactions



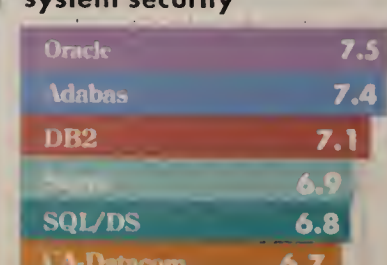
8.4 Effective user-defined integrity



8.1 Effective programming tools



7.5 Integration of DBMS and operating system security



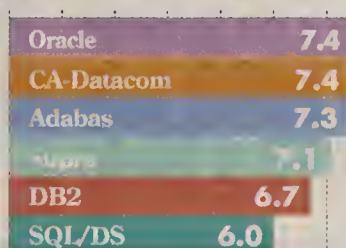
RATINGS IN ORDER OF IMPORTANCE

(Mainframe RDBMSs, continued from previous page)

7.5 Support for standard SQL



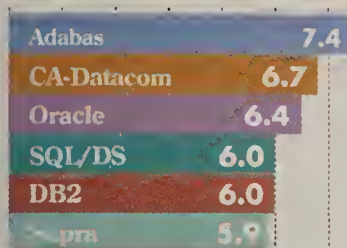
7.5 Effective end-user tools



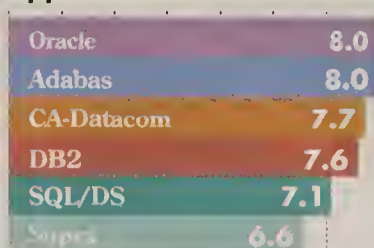
7.4 Multilevel security features



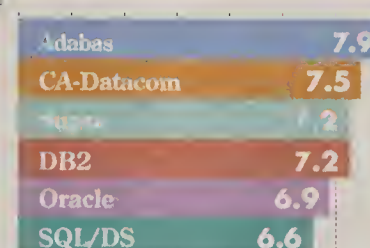
7.4 Performance and system monitors



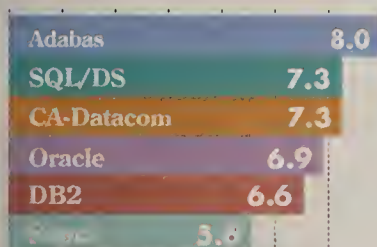
7.3 Performance in decision-support applications



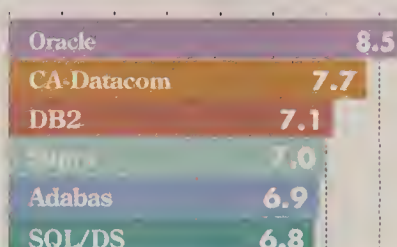
7.0 Auditing functions



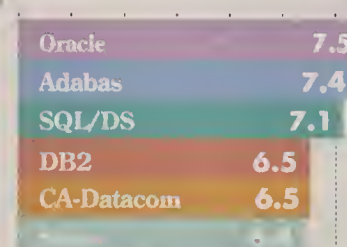
6.9 Distributed updating, recovery and remote administration



6.6 Useful SQL extensions



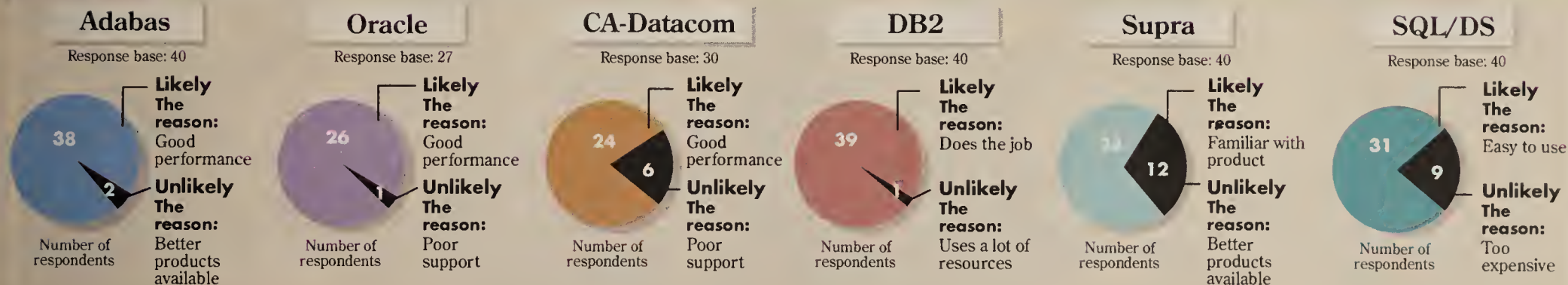
6.4 Integration of CASE tools



Loyalties

Would you purchase the product again?

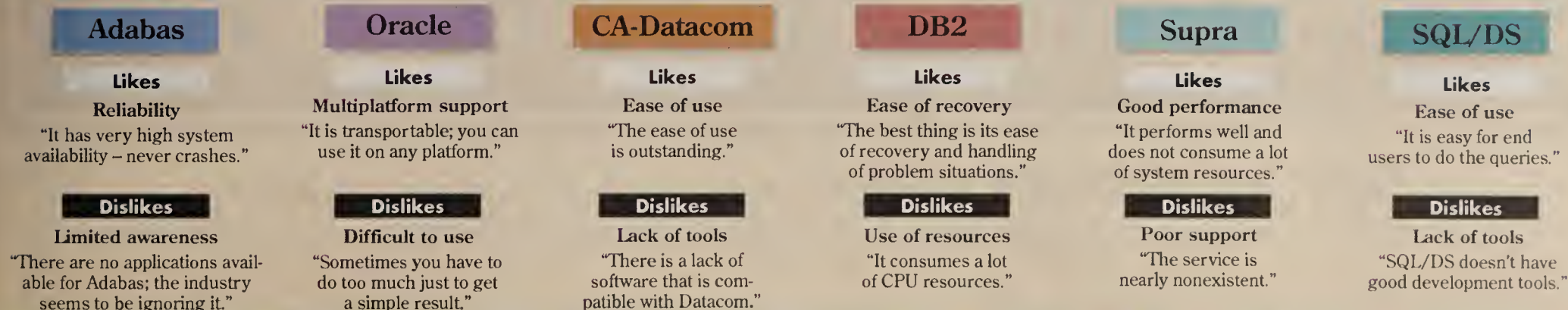
(Reasons are based on most frequently stated responses)



Verbatim

What do you see as the strengths/weaknesses of this product?

(Reasons are based on most frequently stated responses)



Vital statistics

Total number of respondents: 218

What is your position?

IS director	21
IS manager	29
Database supervisor	86
Other	82

In which industry does your company do the majority of its business?

Manufacturing	53
Government agencies	34
Education	33
Insurance	20
Retail	10
Transportation	9
Other	59

What is your responsibility for mainframe RDBMSs?

Evaluate or recommend vendors	196
Set standards for your organization	190
Determine need	174
Select vendors	165
Approve or authorize purchase	91

How long have you been involved with mainframe RDBMSs?

Five years or more	172
3-4 years	30
1-2 years	13
Less than one year	1
Don't know	2

METHODOLOGY

Products included in Buyers' Scorecard are market share leaders with relational database management system functionality, including SQL support, on IBM or compatible mainframes.

User names were obtained from a combination of vendor and nonvendor sources. First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results.

The response base was 40 users each for IBM's DB2 and SQL/DS; 40 for Cincom Systems, Inc.'s Supra; 40 users for Software AG of North America, Inc.'s Adabas; 30 users for Computer Associates International, Inc.'s CA-Datcom; and 28 users for Oracle Corp.'s Oracle.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100. The ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers are rounded off where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following individual and firm for their assistance in preparing this Buyers' Scorecard: CW Database Division; David McGovern, Alternative Technologies, Inc.

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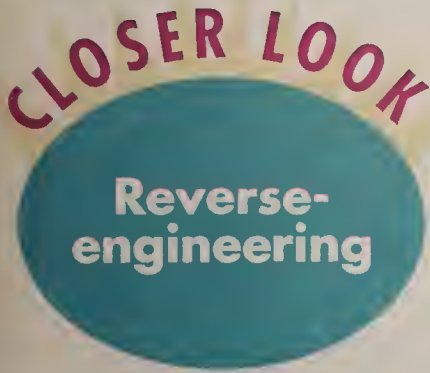
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Whipping worn-out code into new shape



BY KIM S. NASH
CW STAFF

Some users are taking a step backward to go forward.

Re-engineering software programs — not to be confused with the current catchphrase, re-engineering the business process — is really a two-step affair. Reverse-engineering products analyze existing applications. They draw entity-relationship models and data flow diagrams showing the cause-and-effect patterns between tasks performed by chunks of code.

Re-engineering products bring that analysis forward, actually reworking and streamlining applications.

The process is taking root in systems departments for two reasons: to save on software maintenance costs and to clean up legacy systems in preparation for moving applications to different hardware platforms.

Estimates vary of the amount of money and time saved by wringing tangled systems through reverse-engineering

tools, mostly because that is all that is available — estimates.

“Reverse-engineering vendors have been promising huge benefits for a few years now, but so far, I’ve seen limited success,” said Andrew Topper, an analyst at Foresite Systems, Inc., an application development consulting firm in Okemos, Mich.

That is because most tools, including those from market leaders Bachman Information Systems, Inc. in Burlington, Mass., and Viasoft, Inc. in Phoenix, address only one side of the reverse-engineering equation. They adeptly manage the dividing and reordering of data structures but are not as powerful for understanding the business pro-

cesses underlying the data, analysts and users agreed.

Reverse-engineering tools can help users understand the functions performed by blocks of code and how one task affects another.

In the average shop, about 60% of the time spent on maintenance is spent figuring out what the system is doing, according to Topper. Automating that work can realistically cut that “figuring” time to between 25% and 30% of total time spent on the overall maintenance function, he said. That is a far cry from the 5% figure bandied about by some vendors.

Nevertheless, there are promising projects under way. For example, Ultramar Canada,

Inc., a petroleum refiner in Toronto, is using Bachman’s flagship family of tools to design a database based on IBM’s DB2.

When Ultramar’s 100 or so programmer/analysts begin breaking down Cobol applications within a year, the Bachman-made database will act as a storehouse for the revamped data files, according to Ian Wickins, supervisor of wholesale systems.

If reverse-engineering sounds intriguing, look before you leap. Consultants advise the following steps:

- Evaluate your application mix, including programming language, types of programs, transaction monitor and database.

Continued on page 70

Basic ingredients

A half-dozen key vendors offer reverse-engineering products designed to convert old applications into new, cleaner code

Bachman Information Systems, Inc.
Product: Bachman Series

CGI Systems, Inc.
Product: PacReverse

Intersolv, Inc.
Product: Design Recovery

Viasoft, Inc.
Product: Via/Renaissance

KnowledgeWare, Inc.
*Product: ADW/Maintenance Workstation**

Texas Instruments, Inc./Price Waterhouse
*Product: RE for IE**

* Announced, not shipping

CW Chart: Janell Genovese

Reverse-engineering in C

Considerably smaller than Cobol programs used for production applications, C programs tend to be less disciplined and less structured. In the past, “there’s been a lot of hacking” in C development efforts, said Adrian Bowles, vice president and director of advanced software development research service at New Science Associates, Inc. in Westport, Conn.

For any company trying to unravel its C programs, there is a variety of new reverse-engineering tools that can be useful. However, anyone considering such a tool should ask a few preliminary questions.

“Are you trying to document the code; understand [the code] to fix it; or are you considering re-engineering your C code to maintain it at a higher level in the future?” asked Gene Forte, executive editor of “CASE Outlook,” an industry newsletter

published in Lake Oswego, Ore. Such questions dictate the tools that will work best.

The following is a sampling of tools that can be used with C programs:

• Program understanding and maintenance

Hindsight from Advanced Software Automation, Inc. in Santa Clara, Calif., handles documentation, interactive structure charts, static and complexity analyses.

Smartsystem from Procace Corp. in Santa Clara, Calif., provides modular tools for program filtering and viewing, function call graphing, syntax and consistency checking, debugging and editing.

• Charting and analysis

AutoFlow-C from Autocase Technology in Cupertino, Calif., converts C and C++ programs into flow charts and structure charts.

Clear+ for C from Clear Software, Inc. in Newton Upper Falls, Mass., produces flow charts, function cross-references and formatted source listings.

Logiscope from Verilog, Inc. in Dallas provides call graphs and metrics.

The McCabe Tools from McCabe & Associates in Columbia, Md., handles flow charts, structure charts and a variety of standard metrics.

• Development workbenches

C Development Environment from Interactive Development Environments, Inc. in San Francisco is an integrated environment with development, documentation, analysis and design tools.

Ensemble from Cadre Technologies, Inc. in Providence, R.I., is a modular workbench with charting, testing, metrics, design and reverse-engineering tools.

GARRY RAY

Lean tacos

Have you noticed that while you wait to board the red-eye flight to San Francisco, you can run over to a Taco Bell for a burrito to tide you over?

That is because Taco Bell has expanded its historic U.S.-only, restaurant-only business strategy to include airport outlets, sidewalk pushcarts and other sites both here and internationally.

The company’s re-directed business strategy calls for a change in thinking among all employees but especially affects information systems, according to Jeff Buckner, a data analyst. The shift triggered an IS mandate to gather applications now spread across different divisions of the corporation, clean them up and store them in IBM’s DB2.

The company outfitted its 60 programmer/analysts with \$200,000 worth of Bachman’s reverse-engineering tools.

The company is gradually turning its flat file, VSAM and IDMS applications into what it hopes will be leaner DB2-based applications.

Taco Bell purchased the tools before the business change but had not made much use of them until recently, according to Buckner. As a Bachman-certified instructor, he is leading several teams of 5 to 15 staff members through training on the products and the model-driven methodology behind them.

Buckner said that Bachman’s tools have reduced by 50% the amount of time his staff spends on application analysis, and he said he expects even more savings as the project teams come up to speed.

“During the past six months alone, things have really been heating up as we’ve gotten better with the tool,” he explained.

The biggest caution Buckner has for potential new users is this: “Spend a lot of time on education. Any project you try will be daunting at first.”

KIM S. NASH

Caseworks revises GUI tool to support client/server

BY GARRY RAY
CW STAFF

As corporate developers become more sophisticated about client/server computing and graphical user interfaces (GUI), tool vendors are having to enhance and revamp their products to meet new demands.

A recent example is the revision of Caseworks, Inc.'s CASE:PM, a GUI designer and C-code generator for IBM's OS/2 Presentation Manager.

One of the first to enter the now-crowded arena for GUI design tools, the Atlanta company has released CASE:PM VIP, an updated version of the tool. Like other vendors of such tools, including Easel Corp. in Burlington, Mass., Caseworks has taken an add-on approach to answering the client/server question.

Through modular additions to the \$3,495 program, which the company calls "designers," it intends to include support for a variety of client/server computing methods, delivering support for IBM's CICS OS/2, Advanced Program to Program Communication and High Level Language Application Programming Interface. Another designer, said Terry Flaherty, Caseworks vice president of marketing, will support SQL. All will be delivered during the fourth quarter, he added.

According to Flaherty, CASE:PM VIP uses this same "designer" technology to create

various parts of the GUI. Designers shipped with the product include an application designer, which contains global application and platform information; a Dynamic Link Library (DLL) designer, which creates an OS/2 DLL containing all interface components such as windows

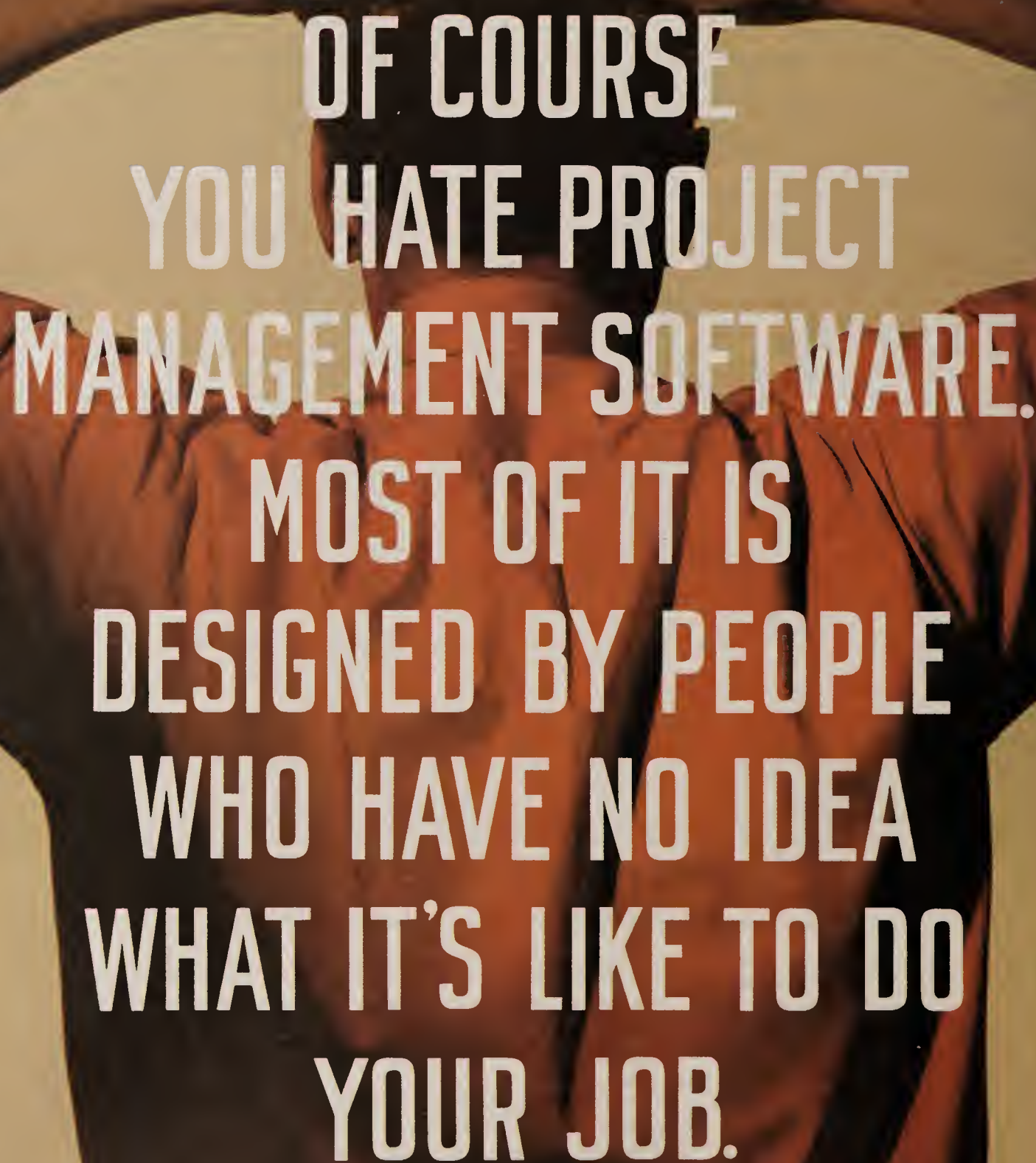
and panels; and a variety of designers for other CASE:PM components, such as windows, panels, menus, data structures and user-defined application code. Two specific designers that support IBM's Common User Access '91 interface specification are the notebook and

container designers.

Separately, Caseworks announced that it will license its proprietary knowledge bases for CASE:PM and its Microsoft Corp. Windows design tool, CASE:W. The knowledge bases, which translate GUI designs into C-language code, are normally

encrypted and unavailable to users. Flaherty said licensed users will be able to customize these knowledge bases to generate C code that conforms to company standards or add proprietary features, such as a communications protocol, to the standard Caseworks environment.

Licenses for Caseworks' Open Knowledgebase technology begin at \$35,000.



OF COURSE
YOU HATE PROJECT
MANAGEMENT SOFTWARE.
MOST OF IT IS
DESIGNED BY PEOPLE
WHO HAVE NO IDEA
WHAT IT'S LIKE TO DO
YOUR JOB.

Whip code into shape

CONTINUED FROM PAGE 69

- Talk to at least five companies with comparable environments, avoiding canned customer references provided by the vendor.
- Remember the difference between data and process reverse-engineering — that is, current products cannot accomplish the latter.
- Be realistic. Existing tools can help uncover overly complex Cobol and sections of code that are not being executed.

Users have to be well-versed in the nuances of a given tool before they can expect to bring home the bacon, observers agreed. Extensive training is required, according to Jeff Buckner, a data analyst at Taco Bell Corp. in Irvine, Calif. Taco Bell, a division of Pepsico, is using Bachman tools for an extensive, if gradual, revamp of its entire portfolio of applications, Buckner said.

"We're struggling through a lot of changes right now," Buckner said. "Analysis is everything in reverse [engineering]."

NEW PRODUCTS

Application development tools

Watcom is shipping a line of client/server SQL database and application development tools.

The products were designed to help users deliver personal computer-based client/server

SQL database solutions on a much wider scale. The Developer's Edition consists of a single-user SQL database server for stand-alone PCs and tools for C and C++ development of SQL applications. The Network Server Edition has a SQL database server that runs on a dedicated database server machine.

The Developer's Edition costs \$795. The Network Server Edition costs \$795 for a six-user version and \$1,595 for an unlimited-user version.

Watcom
415 Phillip St.
Waterloo, Ontario
Canada N2L 3X2
(519) 886-3700

ProtoView Development Co. has

released ProtoGen 3.0 for Microsoft Corp.'s Foundation Class code generation.

The product is bundled with a code generator for Borland International, Inc.'s Turbo Pascal for Windows, ANSI C and Borland's Owl C++ code generators. ProtoGen 3.0 features a menu designer, interactive test mode, controls on the main window and support for custom con-

trols. It uses snap-in code generation technology, providing single-user interfaces to any one of the four generators. Four generators offer users a choice of target languages for selection and provide alternative implementations of the same user interface for comparison.

ProtoGen 3.0 costs \$199.

ProtoView Development
353 Georges Road
Dayton, N.J. 08810
(908) 329-8588

Logic Works, Inc. is shipping Version 1.1 of the Erwin/ERX database design software. Support for Oracle Corp.'s Oracle 7.0 is provided and offers enhanced reverse-engineering.

The product has an open architecture that allows users to move data to and from repositories, report generators, external data dictionaries and computer-aided software engineering tools using the ERX file format. It features automatic layout, copy and paste models and selective reporting and schema generation. Support for Gupta Technologies, Inc.'s Gupta SQLBase 5.0, Microsoft Corp.'s SQL Server 4.2 and Informix Corp.'s Informix 5.0 is included.

The product costs \$1,995.

Logic Works
Suite 112
214 Carnegie Center
Princeton, N.J. 08540
(609) 243-0088

Languages

Blue Sky Software Corp. has released Version 4.0 of WindowsMaker Professional, a prototyper and C/C++ code generator for developing Microsoft Corp. Windows applications.

WindowsMaker Professional 4.0 creates applications for Windows 3.1 that can be migrated across platforms and languages. New features include creation of professional-looking applications and access to commonly used functionality, plus a new architecture using Switch-It Code Generation Modules. The modules consist of a knowledge base for generating code for a specific platform, allowing for language and platform independence.

The product costs \$995.

Blue Sky Software
Suite 3
7486 La Jolla Blvd.
La Jolla, Calif. 92037
(619) 459-6365

Project management software seems to have one fundamental flaw: the people who design it usually aren't project managers. So they don't think the way you do. They give you functions you don't need or they oversimplify your job with products that soon become obsolete.

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115.2 Kbps async and 19.2 to 24 Kbps sync.
Until now, dial speed like this
was something you only dreamed of.

The world's fastest dial modem can really make information fly.

For speed-sensitive, bandwidth-hungry applications – the ones users frequently complain about –

Motorola Codex now offers the world's fastest dial modem.

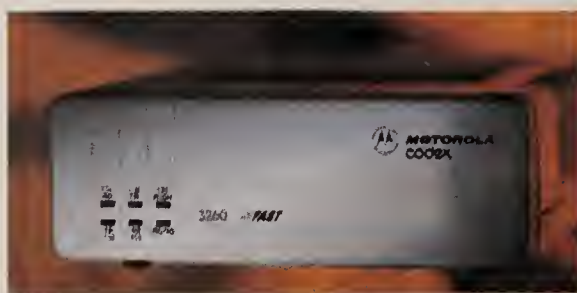
Our new networked-managed V.fast modem, 326XFAST, is the only dial modem available today to provide through-

It's also ideal for: multi-media and graphics-intensive applications, large file transfers, desktop publishing and off-peak polling. Plus, it's the perfect back-up for DDS and VSAT digital technologies and as a Switched 56 alternative.

Also, we ensure forward compatibility with the CCITT standard.

Like all of Motorola Codex's award-winning dial products, we back up V.fast with a 2-year warranty and a 24-hour replacement service. And it's available now from North America's most sophisticated Authorized Distributor network.

Why have your users settle for slow when they can fly with fast? V.fast from Motorola Codex.



Motorola Codex's new V.fast. You just can't find a faster dial modem.



Anyone can move a ton of information. The question is how fast.

19.2 to 24 Kbps sync.

Speed like that is ideal for applications like remote LAN access that's notoriously slow, especially in a Windows environment. With V.fast, remote PC users can work just as productively as if they were on a local node.

put up to 115.2 Kbps async,



MOTOROLA
codex



(.)



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1-800-426-1212 Ext. 212

PRODUCT SPOTLIGHT



Travel accessories



With mobile computing on the rise, IS has a new task: Choose peripherals that give staff a competitive edge and a ready lifeline back to the office

Traveling pointing devices are becoming more important with Windows use on the rise. So far, though, nothing is quite as easy to use as the stay-at-home versions.

pg. 76



Portable modems top everyone's accessory list. Fast models are recommended for large file transfers, while slower speeds are OK for simple E-mail.

pg. 74



You can't have it all in portable printing. You can have some speed and an automatic sheet feeder — if you're willing to lug around 6 to 8 pounds. If you're not, you'll print 1 page a minute and feed sheets one at a time.

pg. 76



Pocket LAN adapters are handy for attaching notebooks to LANs, but performance has always been an issue. Now there are options that add speed into the equation.

pg. 77

It's no longer "pioneering" to carry a portable. From executives to salesmen to service people, every professional who travels will, at some point, carry a notebook or laptop computer and use it while on the road to dial into the office. Or fax a document to a client. Or broadcast an electronic message to his staff.

Even hotels, airports and public telephone companies have caught on: Only the truly backward hotel fails to supply modem hookups, and all but the most rural airports will soon be equipped with dataphones.

So congratulations on your new job responsibility. It's up to your staff to support the ever increasing number of remote and mobile users when they ask what's the best way to remotely access mainframe or server data. Or why their portable printer keeps jamming. Or why they can't edit their received faxes. Or how they can hook their notebook into the local-area network.

A mobile computing environment needs to do two things: allow users to work independently of the corpo-

rate structure and also tie in to the corporation when they need to. That means communications vehicles must be built, security must be addressed, and a computing architecture must be established to transmit timely data — possibly automatically — to notebooks in the field.

A good start is to equip travelers with the right equipment in the first place. And this is one market niche that's not at a loss for variety. There are portable compact disc/read-only memory drives and portable scanner adapters. There are vendors that specialize in carrying cases not just for notebooks but also for disks, phones and extra batteries. If you wanted to pack all the extras — single-outlet surge protectors, extra phone lines, duplex jacks, portable printer ribbons — you'd need extra bags.

The following pages will acquaint you with buying tips for the most in-demand accessories, the ones your users will soon be looking for, if they aren't already. To avoid future headaches, you'll want to start getting answers right about now.

Just a modem?! Not anymore

BY MARK LEASER

Modems were never considered a strategic product category — until the rise of mobile computing. Now, applications such as electronic mail, remote database access and sales order processing — which depend on a reliable mo-

dem — are an absolute necessity for mobile users. For some companies, modems and the applications that drive them are the first consideration in outfitting notebooks for executives, salesmen and service people.

Choosing the right modem is not as easy as it used to be. Two years ago, you picked either a "slow" 1,200 bit/sec. modem or a

"fast" 2,400 bit/sec. internal modem. External modems were just too heavy.

Now users are more demanding, and there's more to choose from. The best way to make your choice is to look at five major considerations: speed, compression, error control, internal vs. external modem and fax capability.

A question of speed

► Get ready for acronym city. Today's typical high-speed modem is described as a V.32, V.42 and V.42 bis modem. That means it has a speed of 9.6K bit/sec. (V.32), it can compress files to one-quarter of their original size (V.42) and it has an advanced error control system that makes sure the data is transferred properly (V.42 bis). When all is working optimally, the compression scrunches the file to one-fourth its original size, quadrupling the speed to 38.4K bit/sec.

You can get a faster modem; those with V.32 bis transmit data at 14.4K bit/sec. With 4-to-1 compression, speed is upped to 57.6K bit/sec.

Whether you need such speed depends on your application. For simple E-mail applications or small data files, a 2,400 bit/sec. modem without data compression is adequate. However, users who begin using E-mail for simple text transmission may eventually want

to use the system to transfer spreadsheets and other large files.

If that's a possibility or if speed is a consideration, your safest buy is a 9.6K bit/sec. modem with 4-to-1 compression and V.42 bis error control.

The price gap is narrowing. Today, the street price for these high-speed modems is less than \$500; buy direct, and you can pay closer to \$299, such as for **Telebit Corp.**'s QBlazer.

In any case, both the sending and the receiving modems must be compatible to achieve the highest level of performance. But they don't have to be from the same manufacturer.

Popular 2,400 bit/sec. modems with V.42 bis compression and fax: Extech Data Systems (617) 890-7440 (\$349); Megahertz Corp. (801) 272-6000 (\$379); Telenetics Corp. (714) 455-4000 (\$395); Ven-Tel, Inc. (408) 436-7400 (\$229).

Internal? External?

► Most notebook-toting road warriors won't look at an external modem. The thought of carrying another gadget is abhorrent, even if it fits in the palm of their hand. The benefits of an internal modem are numerous: no extra cables, batteries or power supply.

But external, or pocket, modems have their advantages. Consider the useful life of a notebook computer vs. that of a modem. A 9.6K bit/sec. pocket modem purchased today will probably still meet your needs in two years. It is unlikely that a notebook purchased today will do the same; when the notebook goes, so does the internal modem.

There is also a better selection of 9.6K bit/sec. modems in the pocket category. Today, most internal modems run at 2,400 bit/sec., but expect to see

more high-speed internal modems in the next six to 12 months.

Unlike internal modems, pocket versions sometimes provide LED indicators that monitor modem transmissions. Both **Telebit Corp.**'s QBlazer and **U.S. Robotics, Inc.**'s WorldPort modem have this feature.

Finally, some pocket modems provide a jack to connect an acoustic coupler.

With the recent advances in modem chip sets from **AT&T Paradyne** and **Rockwell International Corp.**, modem manufacturers are now producing very small pocket modems with low power requirements. **Megahertz Corp.**'s P296FMV is a good example of these new external modems, weighing under 7 ounces and measuring 3.4 by 2.3 by 1 in. (see chart below).

External modems' longer potential life span increases the importance of a warranty. Warranties range from five years to lifetime options, such as for **Piiceon** and **Dallas Fax, Inc.**

Because of the extra manufacturing costs, external modems often cost more than internal modems. U.S. Robotics' WorldPort 2,400 bit/sec. V.42 bis external modem lists for \$349, while its equivalent internal modem costs \$299. On the other hand, Megahertz's external, high-speed 9.6K bit/sec. fax/modem is \$50 less than its internal version.

Next year, we'll begin to see modems built around the Personal Computer Memory Card International Association standard (see story page 75).

Popular third-party modem vendors include Megahertz (801) 272-6000 and Holmes Microsystems, Inc. (800) 648-7488.

Leaser is president of the Executive PC Institute in San Diego, which specializes in sales force automation.

Speedy pocket modems

Modems capable of V.32 speed, V.42 bis compression

	SIZE (INCHES)	STANDARDS	ON/OFF SWITCH	FAX SEND/ RECEIVE	RJ11 TWIN JACKS	STATUS LIGHTS	PRICE
Dallas Fax, Inc. (214) 699-8999 9696 Pocket Fax/Modem	4 x 2.25 x .75	Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32, V.32 bis/MNP-5, V.42 bis/MNP-2, MNP-3, MNP-4, V.42	Yes	Yes	No	Running on AC or battery	\$328
Megahertz Corp. (801) 272-6000 The Megahertz P296 Pocket Laptop Fax/Modem	3.4 x 2.3 x 1	Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32/MNP-5, V.42 bis/MNP-4, V.42	No	Yes	No	None	\$669
Microcom, Inc. (617) 551-1000 MicroPorte 4232 bis MicroPorte 1042	4.56 x 2.75 x 1.5	Both models support Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32/MNP-5, V.42 bis/MNP-4, V.42. MicroPorte 4232 bis also supports V.32 bis.	Yes	No	Yes	Transmission speed, battery life, data terminal ready, power on	\$899 (4232 bis) \$649 (1042)
Telebit Corp. (408) 734-3333 QBlazer	2.3 x 2.4 x 2.4	Bell 103, Bell 212A, V.22, V.22 bis, V.32/MNP-5, V.42 bis/MNP-4, V.42	Yes	No	No	Send/Receive data, carrier detect, off hook, modem ready, data terminal ready, error correction, low battery	\$599
Telenetics Corp. (714) 455-4000 Pony Express I Pony Express II	4.5 diameter (round)	Both models support Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32/MNP-5, V.42 bis/MNP-4, V.42, MNP-2-4. Pony Express I also supports V.32 bis.	Yes	Yes	Yes	Transmission speed, battery life, running on AC or battery	\$695 (Pony Express I) \$555 (Pony Express II)
Vocal Technologies Ltd. (408) 980-5181 Stowaway 14,400	2.2 x 3 x 0.8	Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32, V.32 bis, Fax Group III, Class 2/ MNP-5, V.42 bis	No	Yes	No	Transmit data, receive error correction, data terminal ready, carrier detect, off hook, modem ready	\$499

Modem standards

Speed:

Bell 103	300 bit/sec.
Bell 212	1,200 bit/sec.
V.21	300 bit/sec.
V.22	1,200 bit/sec.
V.22 bis	2,400 bit/sec.
V.23	1,200 bit/sec.
V.32	9.6K bit/sec.
V.32 bis	14.4K bit/sec.

Compression:

MNP-5	2:1
MNP-7	3:1
V.42 bis	4:1

Error control:

MNP-2, MNP-3, MNP-4, MNP-10, V.42	
--	--

Wanna fax?

Fax capabilities are available on internal and pocket modems for several hundred dollars more.

The typical fax/modem sends and receives faxes between a notebook computer and any Group 3 fax machine at 9.6K bit/sec. However, it may not transmit data at that rate. There are loads of fax/modems with a 2.4K bit/sec. data rate and a 9.6K bit/sec. fax speed.

Sending a fax is a lot easier than receiving one. Received faxes take eons to view, eat up disk space and spend forever printing. If you find a modem you like that has only send functions, you can save up to \$100.

Receive capabilities are really worth it only when you have fax software such as FaxGrabber from Calera Recognition Systems, Inc. that can convert the incoming fax to a text file, allowing the user to edit it. Many fax/modems come bundled with fax software, but you may have to buy another package to get the features you want.

►OK, picture this: A salesman is meeting with a customer. Together, they complete a project plan using a spreadsheet. The customer asks for a print-out. One glance at the guy's ancient dot matrix printer is enough. "I'll just send it to your fax machine," the salesman says.

The salesman connects the phone line to his notebook computer, loads the spreadsheet and selects "Print." But rather than selecting his regular printer, he selects a fax program. In minutes, his customer's fax machine is printing the spreadsheet, which looks a lot like it would on a laser printer.

Welcome to the new world of fax software. Many older packages required you to convert a document to an ASCII file before faxing; today's packages make it as easy as selecting "Print."

In the Windows environment, the programs function just like a printer. In the DOS world, packages such as WinFax Pro from Delrina Technology, Inc. redirect the printer output to a fax machine.

In addition to standard "send" and "receive" functions, these programs have a host of other capabilities. For example, you can fax a group of documents from several applications and in-

Faxing can be easy

clude a customized cover sheet. Some companies are using this broadcasting feature to distribute product sheets and newsletters to customers and contacts.

Some vendors are bundling optical character recognition (OCR) software with their fax software. This converts incoming faxes into text that can then be retrieved into word processing soft-

ware or other programs that accept ASCII text. Expect to pay about \$50 more for OCR software.

In the end, the two most important factors to consider are ease of use and compatibility. The Windows programs all install and work like a printer. As for DOS, look for a package that does the same without requiring multiple steps.

Fax software

Bit Software, Inc.

(510) 490-2928

BitFax for DOS (\$40)

BitFax for Windows (\$79)

Caere Corp.

(408) 395-7000

FaxMaster

Price: \$249

Delrina Technology, Inc.

(408) 363-2345

WinFax Pro

Price: \$119

Intel Corp.

(800) 538-3373

Faxability Plus (\$119)

Faxability Plus/OCR (\$249)

MagicSoft, Inc.

(708) 953-2374

MTEZ ExpressFax

Price: \$99

SofNet, Inc.

(404) 984-8088

Faxit

Price: NP

Transfax Corp.

(310) 641-0439

Transfax

Price: \$189

The future is on a card

BY W. BRYAN HASTINGS

►Modems, LAN adapters and hard drives are starting to take on a new — and smaller — look altogether. This is due to the Personal Computer Memory Card International Association (PCMCIA), a group formed three years ago by Fujitsu Ltd., Lotus Development Corp. and a handful of other companies to set and promote a standard for solid-state memory cards and drives.

The group broadened its standard as the technology became available to build I/O devices, such as modems and LAN adapters, into the same small form factor.

Roughly the size of a credit card and several millimeters thick, PCMCIA devices are superior to rotating media in all respects. Devoid of moving parts, these solid-state devices are faster, more power-efficient and — a key issue for portable users — much more shock-resistant than hard and floppy disks.

PCMCIA's promotion is paying off. Credit card memory is down from more than \$200 to \$80 per megabyte, and half a dozen manufacturers include the current version of the slot (PCMCIA 2.0) in their portables, with several dozen more products expected on the shelves by the end of the year.

Should you get a PCMCIA-equipped system? If your portable will be exposed to a lot of knocks or vibrations — often the case with pen-based computers, palmtops and ruggedized portables — then the answer is a definite yes.

Otherwise, it's a question of whether you're willing to spend extra money for the extra performance. Apart from cost, a buyer should be concerned with compatibility issues if he wants to use the same card in different systems. Even though PCMCIA 2.0 cards are guaranteed to fit into 2.0 slots regardless of platform, interoperability — even among like platforms such as two Intel Corp. 80386-based computers — is not guaranteed.

Intel has stepped in with Exchangeable Card Architecture, a supplement to PCMCIA 2.0 that guarantees interoperability among similar systems.

Hastings is a free-lance writer in Keene, N.H.

The PCMCIA difference

On a card this size, several millimeters thick, you can have:

- 20M bytes of memory.
- An Ethernet LAN adapter.
- A 2,400 bit/sec. modem.

However, you'll pay \$70 per 1M byte vs. \$5 to \$10 for traditional hard disks for memory and \$400 to \$500 vs. \$100 for the same performance modem. The credit card LAN adapter is comparably priced at \$495.

Communicate!

►Modems are not difficult to use. But modem software can be. You want users to be able to load the program, enter a few keystrokes and have the program dial into the system and handle the connection.

To qualify for consideration, a communications program should meet some basic requirements.

1) If the user will be dialing into a mainframe or mini, make sure it supports the proper terminal emulations.

2) It should include error protocols such as XModem, YModem, ZModem, ASCII and Kermit.

3) So that users don't have to enter long lists of esoteric commands, you will likely want the program to contain scripting or macro functions to automate dial-in sequences.

4) The program should include a dialing directory to support different phone numbers or dialing specifications. For instance, after connecting a

modem to an office phone line, users may have to dial "9" to access an outside line. In a hotel, they may have to dial "8" and then "1."

Most of the popular packages meet these requirements (see chart); however, you do need to make sure your package is compatible with your fleet of modems, in terms of both brand and maximum speed capacity.

Above all, choose the package that has the best and most broad-based support. This includes the support offered by the developer as well as what's available from the modem manufacturer and services such as CompuServe, Inc.'s CompuServe and MCI Mail. That's because the first question a user will hear when he's having transmission problems is, "What communications software are you using?" If the user answers, "Procomm," "CrossTalk" or another leading package, he's in great shape.

Communications software

Datastorm Technologies, Inc.

(314) 443-3282

ProComm 2.4.3

(\$25-\$50 for licensing)

ProComm Plus 2.01 (\$129)

ProComm Plus for Windows (\$149)

Digital Communications Associates, Inc.

(404) 442-4000

Crosstalk XVI

Price: NP

Hayes Microcomputer Products, Inc.

(404) 840-9200

Smartcom III

Price: \$199

Microcom, Inc.

(800) 967-3529

Relay Gold

Price: \$299 (DOS), \$399 (Windows)

Software Ventures Corp.

(510) 644-3232

Microphone II for Windows

Price: \$74.95

NP: Not provided

Printers: Closer, but not there yet

The good news is that print quality has gotten a lot better on portable printers. In terms of battery life, weight, ease of use and speed, however, portables are still about a year away from being ideal.

These printers are appreciated by those who really need them. Last year, only 15% of the people who own portable computers bought portable printers, according to Dataquest, Inc. Among that group, only about 40% say they move the systems around with any regularity.

Not that there haven't been improvements. You can get a very light printer, albeit without a sheet feeder. And you can get a

speed of 6 page/min. — but you'll have to lug about 8 pounds of machine with you.

Vendors with products now in development are working on battery drain, size and weight, with systems expected to weigh between 2 and 4 pounds within a year, including the battery. Improvements are also expected in sheet feeders. Most major printers — with the exception of Citizen America Corp.'s PN48 — now have attachable feeders, but new products will have built-in mechanisms that are not so cumbersome.

Following are the leaders among a handful of portable printer vendors.

Canon Computer Systems, Inc.
(714) 438-3000
BJ-10EX
Price: \$499

- **Weight:** 4.6 pounds with battery.
- **Size:** 12 by 8 by 1 in.
- **Technology:** Bubble jet.
- **Speed:** 83 char./sec.
- **Resolution:** 360 by 360 dot/in.
- **Emulation:** IBM ProPrinter, Canon BJ-130E, Epson America, Inc.
- **Fonts:** Four.
- **Paper handling:** Optional 30-page sheet feeder (\$90).

Eastman Kodak Co.
(800) 344-0006
Diconix 701
Price: \$549

- **Weight:** 5.9 pounds with battery.
- **Size:** 11.7 by 7.68 by 2.4 in.
- **Technology:** Ink jet.
- **Speed:** 3 page/min. (draft); 2 page/min. (quality).
- **Resolution:** 300 by 300 dot/in.
- **Emulation:** IBM ProPrinter, Hewlett-Packard Co. DeskJet Plus.
- **Fonts:** Three.
- **Paper handling:** Built-in 30-page, top-mount sheet feeder.

Mannesman Tally Corp.
(800) 843-1347
MT735
Price: \$999

- **Weight:** 8.3 pounds.
- **Size:** 11.4 by 8.7 by 2.3 in.
- **Technology:** Thermal transfer.
- **Speed:** 6 page/min.
- **Resolution:** 300 by 300 dot/in.
- **Emulation:** Epson America, Inc., IBM ProPrinter, Hewlett-Packard Co. LaserJet II, HP DeskJet Plus.
- **Fonts:** Four.
- **Paper handling:** Built-in 80-page, top-feed sheet feeder.

The BJ-10EX has a huge share of the market and is comparable to the **Eastman Kodak Co.** Diconix 701 in terms of print quality and ease of use. Although it is lighter than the Kodak model, it is larger in dimensions and operates at a slightly slower print speed.

Mike McCormick, a sales manager at Torrance, Calif.-based K & M Co., says he is happy with the Canon BJ-10 now that he has enhanced the fonts with a software package. In fact, he compares its print quality to a **Hewlett-Packard Co.** DeskJet. "It's fine for letters and memos, but I wouldn't use it for a proposal for a new customer," McCormick says. "I also wouldn't use it for graphics because it looks like someone scribbled back and forth when an area is filled in."

McCormick says he likes the printer's simple design and the fact that a plastic cover comes down over all the buttons and switches so you don't have to worry about damaging the system. He's not so happy with its speed.

Dr. Arnold Friedman, a radiologist at Temple University Hospital, uses his BJ-10 as a desktop printer. "The print quality is as good as a laser printer, as long as I use good paper," he says.

The BJ-20 is Canon's newest model. It's faster than the BJ-10EX and has more fonts and a 50-page sheet feeder.

The Kodak 701 is faster than its closest competitor, the **Canon Computer Systems, Inc.** BJ-10EX, and almost as fast as the **HP DeskJet**. But it weighs nearly 6 pounds, and the company calls it a "mobile computer" rather than a portable, meaning that it was designed to be taken on the road when necessary.

With the built-in feeder, "you can put a stack of paper in the feeder and not have to worry about it," says Kim Schallhorn, an information systems programmer at Racine, Wis.-based Western Publishing Co.

"It was really easy to use because it has a menu that types instructions on a piece of paper prompting you on what to do next," she explains.

Peter Engeldrum, president of Imcotek, Inc., a Winchester, Mass.-based consulting, research and design firm, compares the 701's print quality to the HP DeskJet. "It doesn't print as dark, but it has sharper lines and is less ragged than the DeskJet," Engeldrum says. A downside is its weight. "I wouldn't want to carry it," he says. "Also, the sheet feeder is awkward. I almost knocked it off a few times."

Kodak's 180, the first portable printer, is still actively marketed. Its print quality is poor and its speed is slow, but it is inexpensive and lightweight.

The MT735 is the most expensive of the portable printers. However, it prints quickly and with good quality and is best for users who need to print large numbers of high-quality documents.

"For our purposes, it's the only thing out there," says Ron Slater, systems and processing manager at Canton, Mass.-based Boston Mutual Life Insurance Co. "We go into a company and take insurance applications all day long that have to be printed out," he says.

The company has owned 40 of the printers for about four months. "The only downside is that you get 150 pages to one thermal ribbon, so people have to carry new ones and pop them in," Slater says.

At Jacksonville, Fla.-based Barnett Mortgage Co., 120 of the firm's employees take the printers on the road for printing loan documents in the field. These need to be of high quality and printed quickly.

"It's faster than our HP II laser printer," says Bob Siedow, who orders equipment and provides hardware support for the operations department at Barnett. "And if you use the right paper, it can look like a laser printer."

Paper is an issue with the MT735. If you use heavy stock, it gets sucked into the printer and jams the system. You should use fine, smooth-surface paper, which is slightly more expensive.

er, he says, paper-feeding is inconvenient.

Print quality is a complaint for Dr. R. Wayne Porter, a general practitioner at the Duckworth Muse Medical Clinic in Piggett, Ark., who uses his PN48 to send letters to patients. "The multiple ribbon is only about half as dark as the single," Porter says, referring to the optional multiple-strike ribbon that claims 50 to 70 pages per ribbon. Single-strike ribbon yields 20 to 25 pages.

He has found that it helps to feed paper into the top of the printer rather than the bottom. "It's tricky to work it in, but it comes out darker for some reason," Porter says.

Citizen America Corp.'s PN48 is the lightest and smallest of the leading portable printers on the market. It is best suited for people who print only a small number of documents and who definitely need true portability.

David Buchinsky, an assistant administrator for diagnostic imaging at Temple University Hospital in Pittsburgh, uses the PN48 to print out documents at home or on the road when he is on call. "I can fit the printer, a computer and a power pack into a case that is no larger than most pocketbooks," Buchinsky says.

He says he was primarily attracted to the system because of its weight; howev-

Citizen America Corp.
(310) 453-0614
PN48 Notebook Printer
Price: \$469-\$549

- **Weight:** 2.5 pounds with battery.
- **Size:** 11.7 by 3.5 by 2 in.
- **Technology:** Thermal fusion.
- **Speed:** 1 page/min.
- **Resolution:** 360 by 360 dot/in.
- **Emulation:** Epson America, Inc., IBM ProPrinter, Citizen GSX.
- **Fonts:** Two.
- **Paper handling:** No sheet feeder. Single-page bottom and rear feed.

More storage

Face it. Even if you buy notebook computers with 120M-byte drives, sooner or later users will want more space. When that time comes, you can 1) Tell them to delete unnecessary files. 2) Buy disk compression software that can double the space. 3) Replace the original hard drive. 4) Buy a portable hard drive.

A growing number of manufacturers are producing pint-size hard drives that weigh about 2 pounds and fit in a briefcase along with a notebook personal computer. This fall you'll see even smaller drives — such as **Simplicity Computing, Inc.**'s PocketDisk, based on a 2½-in. drive and weighing less than a pound.

Installation is easy. An install program adds a driver to the main hard drive while you attach the portable unit to the printer port. A printer port on the drive lets you keep using the printer.

You do pay a premium for these portable drives, with 80M-byte versions costing about \$700. However, they go up to 500M-byte configurations.

Vendors: Liberty Systems, Inc. (408) 983-1127; Simplicity Computing (800) 275-6525; Tidal Technology, Inc. (510) 748-7272; Vision Logic, Inc. (408) 437-1000.

MARK LEASER

Trackballs, etc.

You can travel with Microsoft Corp.'s Windows, but it's not so easy to travel with a traditional mouse. The cord is too long, and a surface is not always available. That's where traveling pointing devices come in.

The most prevalent is the miniature trackball that attaches to the side of a notebook's keyboard, about an inch away from the keys.

Microsoft and **Logitech, Inc.** are the leading vendors of these devices. While they are more convenient than the stay-at-home variety, they can be difficult to control with your thumb; the movement tends to be jumpy and the ball's motion sticky.

Appoint, Inc. in Pleasanton, Calif., offers a trackball-like device called Thumbelina that can be detached from the keyboard. Fremont, Calif.-based **Microspeed, Inc.**'s MicroTrac is similar.

Another option is the pen-shaped mouse, also available from Appoint. You hold the device like a pen, pushing the mouse button with your index finger and controlling the ball (located where the penpoint would be) by "writing" against any surface.

Other vendors are coming out with miniature mice, which look like traditional mice except smaller. These include Wheat Ridge, Colo.-based **Zirco, Inc.** and Appoint.

MARY GROVER BRANDEL

The well-connected mobile user

BY W. BRYAN HASTINGS

You can buy as many peripherals as you want for your notebook users, but put a check on your spending until you've grappled with the "connectivity thing." All those fancy accessories have to hook up to the notebook to be of any use at all.

The problem isn't so much getting a notebook that has ports; at this point, no self-respecting notebook is sold without a serial and parallel port, a slot for an internal modem and a couple of connectors for a desktop monitor, an external keypad and a bus slot, usually for an internal modem. Portable makers are building into the motherboard many functions normally found on desktop expansion cards, such as video controllers and parallel port systems.

The challenge is getting the right combination of connectors, especially with the ever-increasing variety of totable peripherals. If you've ever tried to use a modem and a mouse at the same time on a notebook with a single serial port and no mouse port, then you know what that's all about. You can also pick up accessories that help you augment the connectors you have.

Pointers

Always carry two 12-ft phone line cords, several "inline couplers" and a duplex jack. The lines let you put your notebook on a hotel desk and still reach the phone jack. You can use the couplers to join the phone lines, while the duplex jack keeps phone and modem connected simultaneously.

Call a hotel first to see if it has built-in data ports on its phones. That way, you can connect your modem and still use the phone. Avoid hotels with phones that are hard-wired to the wall.

MARK LEASER

Basic model

Nearly all notebooks and laptops supply the following ports:

Serial

Connects pocket modems and pointing devices such as mice.

Parallel

Appropriate for printers, LAN adapters and most external hard and floppy drives.

Connector to an external monitor

A 15-pin "D" connector that serves as a port for VGA and Super VGA displays, such as desktop monitors and projection panels. Some late-generation portables, such as those from AST, Dauphin, Dell and NEC, take advantage of this by offering Super VGA video controllers.

Internal bus slot

Generally intended for internal, proprietary modems. Much smaller than the standard 8- or 16-bit slot.

Numeric keypad connector

A 1/8-in. plug connector. A few notebooks use a PS/2 connector as a keypad connector.

Enhanced model

Others allow the mobile professional to create a more desktop-like PC from his portable:

Two serial ports

Allow you to use two serial devices at one time. Found standard on Dauphin's 500-GT and as an optional serial port board on AST, Compaq and some Zenith notebooks.

Parallel port

See above.

Connector to external monitor

See above.

Connector to full-size keyboard

Usually a PS/2 connector. Available on models such as NEC's UltraLite SL and Compaq LTE Lites. Some accept only a mouse; others accept either a mouse or a full-size keyboard.

Mouse port

Saves serial ports for other peripherals. Found on most late-generation notebooks. Most are PS/2 connectors that may serve double-duty as an external keyboard connector.

Internal bus slot

See above.

To the LAN — quickly!

► Using pocket LAN adapters sure beats trying to juggle disks between a notebook and a LAN-attached PC or fumbling with file-transfer cables. And it's great giving your notebook instant access to the office network. But you've probably heard a lot of complaints about how slow they are.

These devices, usually the size of a pack of cigarettes, plug into the printer port of any portable, but the convenience is diminished by sluggish network performance compared with a network card.

There are a couple of ways to pick up the pace. One is by choosing the proper portable and LAN adapter. Near-bus card speeds can be achieved with a LAN adapter and portable that sport the Enhanced Parallel Port (EPP). The EPP is found exclusively on 80386SL-based notebooks and is active only on some, such as SL-based PCs in **Compaq Computer Corp.**'s LTE Lite line, **Zenith Data Systems'** Mastersport and Z-note series and **Dell Computer Corp.**'s 325NC and 325NLC notebooks. Only **Xircom**,

Inc.'s adapters take advantage of the EPP.

If nothing less than true bus speeds will satisfy your LAN adapter demands, consider **Megahertz Corp.**'s T2 line of Ethernet and Token Ring adapters. These plug directly into the 100-pin external bus connector found on some **Toshiba Corp.** portables.

Perhaps the most interesting development in portable networking is **D-Link Systems, Inc.**'s PCMCIA 2.0-compliant Ethernet adapter. This slender device plugs into a PCMCIA 2.0 slot (see story page 75), making it the smallest LAN adapter available. By the end of August, the LAN card will be available at \$495 for the Toshiba T3300SL, Dell 320SLI and **Librex Computer Systems, Inc.** T386SX notebooks.

There are about a dozen LAN adapter manufacturers in all. Arcnet and Ethernet adapters list for \$200 to \$450; Token Ring adapters have suggested retail prices of \$700 to \$800.

LAN adapters

Accton Technology Corp.
(510) 226-9800

CNet Technology, Inc.
(408) 954-8000

D-Link Systems, Inc.
(714) 455-1688

Megahertz Corp.
(415) 226-9800

Solectek Corp.
(619) 450-1220

Xircom, Inc.
(818) 878-7600

Options

► There are more and more ports coming out that are intended for specialized uses. And if you use many peripherals, you may be interested in products that eliminate the need for ports or augment the ones that are there.

• **Small Computer Systems Interface (SCSI) connector to CD-ROM drive.** A 25-pin female "D"-style connector. Only **NEC Corp.**'s UltraLite SX/20 offers a built-in version for the company's portable CD-ROM drive. **Compaq Computer Corp.** offers a SCSI-II adapter that plugs into the external bus connector on some of its notebooks.

• **External bus connector.** Used for connecting external optional adapters and expansion stations.

• **PCMCIA slots.** Newest type of port that accepts memory, modems and now LAN adapter cards (see story page 75). Frees up the serial or parallel port you would otherwise use for these devices.

• **Xircom, Inc.'s Multiplexer.** If you find yourself wanting to use your printer and LAN adapter simultaneously but only have one parallel port, this \$95 device allows you to keep your printer on-line and also attach to the LAN. Multiplexer, which works only with Xircom adapters, plugs into the printer port and offers two parallel ports for adapter and printer.

• **Built-in trackball.** Rather than having to dedicate a port to a mouse, some notebooks build the pointing device into the computer. Found on a small but growing number of notebooks, such as **Sharp Electronics Corp.**'s PC-6881, **Compaq's** color screen notebook and **Apple Computer, Inc.**'s PowerBooks.

• **Expansion stations.** If variety and number of ports is what you're after, expansion stations, offered by most major portable manufacturers, are the ultimate. They contain five full-length standard slots and several drive bays, so a user can plug in a network card, a CD-ROM or extra hard drive, a high-resolution video card, etc. They come in two forms:

► **Expansion chassis.** This device is essentially a box that hitches to the external bus connector with a cable or a cartridge that clips to the back of a portable. It contains expansion slots only and ranges from the size of a desktop modem to about half the size of a desktop PC.

The smaller, cartridge-style chassis is especially handy for LAN technicians and other employees who travel from site to site and must access networks of different topologies at different locations.

► **Desktop stations.** The larger expansion chassis is being slowly replaced by desktop stations, which are essentially CPU-less desktop PCs with a square hole in the front. A notebook slides into the hole to complete the system. In their fullest form, desktop stations come complete with desktop monitor, full-size keyboard and table chassis with expansion slots and drives. But desktop stations are expensive, listing for as much as \$850.

Andersen's Foundation For Cooperative Processing CASE product does what other CASE vendors only promise: designs and generates code for client/server applications.

DATAMATION — SEPTEMBER 1, 1991

Considering how much has been written about CASE tools for cooperative processing, we thought you would appreciate an executive summary.

ANDERSEN
CONSULTING
Software Products

INTERVIEW

John Seely Brown

'One of the guiding principles for me is that technology is finally getting powerful enough to get the hell out of the way'

John Seely Brown, director of Xerox Corp.'s legendary Palo Alto Research Center (PARC) in California, is a self-proclaimed BMW fanatic who likes to think deep thoughts as he tears along Route 280 through the Silicon Valley.

Among his ruminations, and the subject of an

article he wrote for *Harvard Business Review* in 1991, is the notion that corporate research laboratories can no longer create new products in a vacuum.

That subject is close to his heart. Brown is well aware of PARC's reputation in the computer industry as an organization whose innovations during the 1970s and 1980s were systematically siphoned off by companies other than Xerox (see chart page 80) to fuel the personal computer revolution.

In the two years since he became PARC's director, Brown has pushed hard to strengthen the collaboration between PARC and Xerox. Products with heavy PARC input are hitting the market, such as Xerox's advanced digital copiers and Paperworks, software that, he says, turns PCs into fax answering machines that receive or distribute information.

Brown, who holds degrees in computer science and math and held joint appointments at the University of California at Berkeley in computer science and cognitive psychology, must be doing something right: Six months ago, he was named chief scientist of the entire corporation. He reports to Xerox Chief Executive Officer Paul Allaire.

Brown joined PARC in 1978 after working at Bolt Beranek and Newman, Inc. in Cambridge, Mass., on advanced artificial intelligence research. In his current position as PARC director, Brown serves not only as chief administrator — keeping watch over all the research done by the 350-member staff — but also as Xerox's corporate liaison for research and development and as a member of Xerox's board of directors. He constantly rushes

from coast to coast, recruiting new talent and talking about controversial new concepts of computing. "Several times a day, you hit something fundamentally new, and you get surprised," he says. "I love it!"

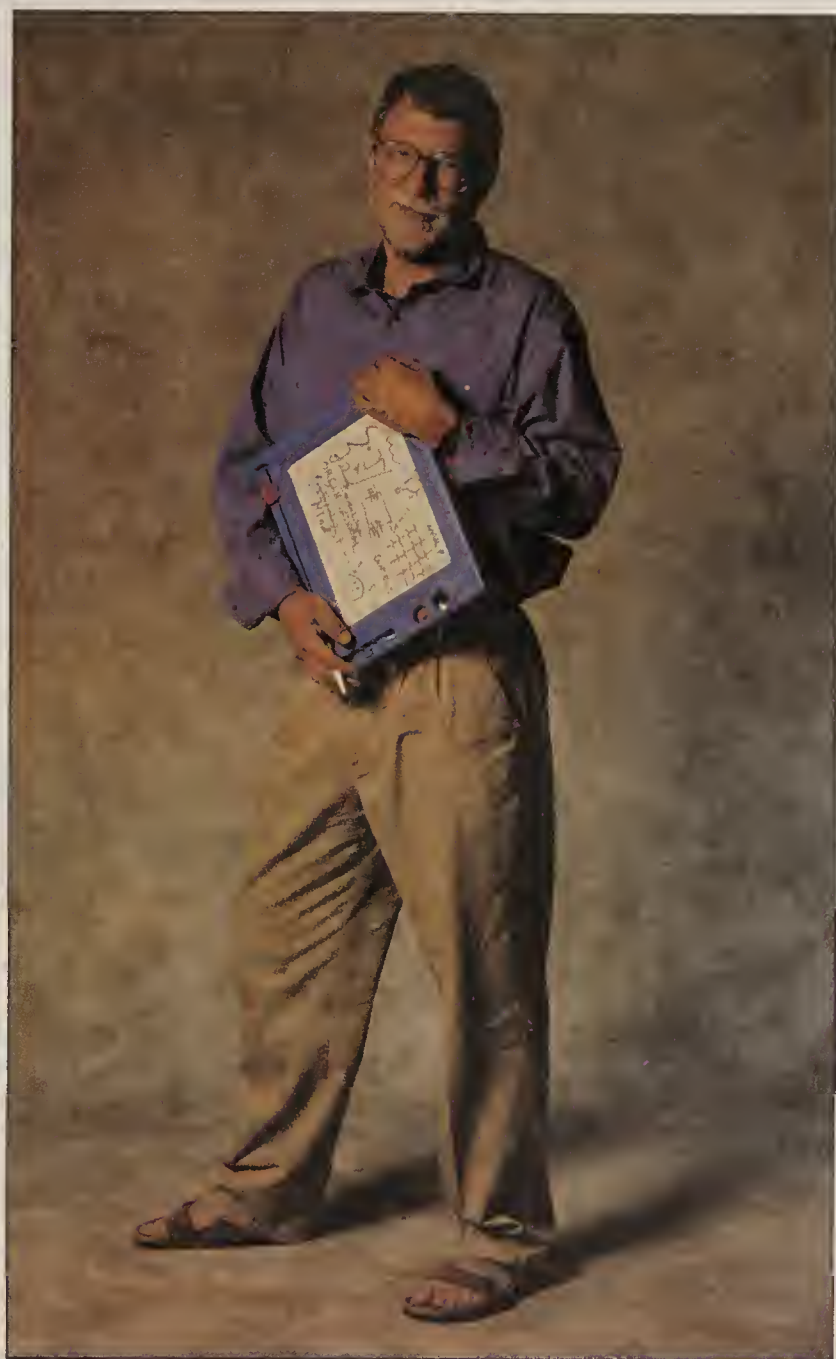
Among his current hot topics is "ubiquitous computing," an idea that PARC, as well as other laboratories such as Olivetti Research in the UK [CW, April 20] and MIT's Media Lab, is trying to put into practice.

The idea, Brown explains, is that the computers of tomorrow will be invisible to users, embedded into our environment rather than sitting as boxes on desktops. He envisions advanced chip technology that will allow the computerization of such mundane items as Post-It notes and blackboards.

Add some sophisticated wireless networking and whole rooms will be empowered with technology. Walls, floors and countertops will know which users are present and will configure the environment to their needs. User-friendly group communication and collaboration will occur instantly and naturally.

The speed with which such computing changes are taking place has Brown wondering whether he can keep pace in a research profession that is "a game of ultra-high-energy young people." That feeling is so strong that the youthful-looking Brown only reluctantly reveals his age: 52. With the apparent energy level of a BMW 750i, however, he need hardly worry.

During a recent trip to Cambridge, Brown met with freelance writer Glenn Rifkin to discuss PARC and his views on where computing is headed.



Tom Zimmeroff

Brown: Computers will be embedded in everyday objects. It'll take wireless nets, advanced chips, but computing will come to masses.

Q How did you get involved in your current work?

A I came to PARC in 1978 [because I had the chance] to create a cognitive science group. It struck me that the constraints of the 1990s were not going to be technological constraints but cognitive constraints. I wanted to find out what things could help people understand how to use technology effectively and appropriately. I wanted to discover how people learn things and what makes something really learnable.

These were issues beyond

icons. Icons and a mouse were kinds of interfaces that allowed users to learn new technology rapidly. But they only go so far. So I argued to Xerox that the key barrier to the future was going to be the move from how technology was used to how people appropriated new work practices around that technology.

Q Where are you taking PARC research today?

A We want to look not only at how an individual appropriates the use of technology but
Continued on page 80

Continued from page 79

how an organization does — the social embedding of technology and how it is used. We want to find out how an organization enacts new work practices, enabled by technology, to become much more productive.

Look at the current productivity paradox: There are very few productivity gains, even with all the spending on information technology in Fortune 1,000 companies. It may be that nobody has thought through new ways to organize that are enabled by these technologies.

Information technology may be a new kind of structural material, just like steel was 80 years ago.

Q That sounds like the concept of re-engineering.

A It's even more than re-engineering. It gets at how you start to tap and release the collective genius of an organization — how you organize for learning.

Q Can you explain the idea of ubiquitous computing?

A The computer world has focused on the box on the desk with the individual using it to the exclusion of everything else. Even with networked computers, you've still got individuals interacting with individual screens networked together. But this is not how people really learn and create. They collaborate over a common work space. I think of it as shoulder-to-shoulder computing, where we collect around one common space. This led to our idea of a live board [a computerized blackboard PARC created].

It was an observation of mine a half-dozen years ago that an amazing amount of productive knowledge work happens around the coffee pot. I'm calling it the distributed coffee pot challenge: How do you have the same kind of familiarity, the same kind of impromptu conversations around a distributed coffee pot, because that's where the action is.

In order to make computers more productive, we have to worry about a sense of virtual collocation, the ability for workers in disparate locations to feel as if they are together with co-workers.

Q So with ubiquitous computing, computers become embedded in the environment around us?

A Many people come to me and say, "What do tomorrow's user interfaces look like?" I say, "Tomorrow's user interfaces are invisible to you." For ubiquitous computing to work, computers have to become a part of the social and physical fabric of our space. They have to become a part of the artifacts we work with.

PARC's vision is of invisible computers in infrastructures that keep you better connected to the world, socially and physically. You won't see tomorrow's computational substrates any more than you see them in your car. You don't ask what operating system runs the computers in your car.

One of the guiding principles for me is that technology is finally getting powerful enough to get the hell out of the way.

I don't want more features; I want it to get out of the way. I want it to become transparent to what I want to get done.

Q Where are you currently on this quest?

A Inside PARC, this is operational in multiple forms. We're laying out the whole notion of how to build a smart build-

Invented here, commercialized there

In the past, companies took Xerox PARC ideas and turned them into products

PARC technology:	Later developed by:
Hardware	
Chip-making technology	VLSI Technology
Silicon compilers for chip design	Silicon Compilers
Portable computing	Grid Systems
Bit-mapped screen displays	IBM, Apple
Mouse- and icon-based computing	Apple
Laser printers	HP, Apple
Drawing tablets	Koala
Ethernet office networks	3Com
Software	
Graphics computing and computer animation	Pixar
Database-retrieval systems	Metaphor Computer Systems
WYSIWYG word processing	Microsoft
SmallTalk language, object-oriented programming	ParcPlace Systems, Digitalk
Desktop publishing and typesetting	Adobe Systems

Source: *The New York Times*

CW Chart: Stephanie Faucher

ing, so even the heating system, the air-conditioning systems know who is in what room and balance the system accordingly. All that is being merged with the ubiquitous computing. Office equipment, [intelligent] badge technology and new types of sensing technology are involved.

Q Does such computing have special requirements?

A It requires multiple levels of networking. We have infrared networking, spectrum networking, near-field effect networking, radio technology networking. We're finding out how you merge all these different kinds of networks that have different bandwidths.

Q Does PARC's focus on how breakthroughs get enacted and used signal a change in Xerox's attitude about its research center?

A In the '70s, PARC was peripheral to the corporation. In the '90s, PARC is central to the corporation. Xerox has embraced PARC's [digital research] and is beginning to ask questions about how digital technology can transform copying.

The DocuTech copier/printer you see on the market today is a symmetric multiprocessor scalable architecture. Hundreds if not thousands of MIPS are required for high-quality, high-speed copying today, let alone scanning, image processing and printing.

With digital copiers, what goes in can now be computed on, added to, augmented, cleaned up, synthesized to what goes out. We've broken the physical link in terms of photons, between input and output. And once you do that, there's a whole new world out there. The demands on computer science are astronomical, and we are heavily invested in scalable computing technology platforms, smart sense arrays, sophisticated solid-state imaging devices, all tied together to stress the foundations of computer science and physics.

Q PARC's reputation has been to invent and then watch someone else create a marketing success with the idea. Are things different now?

A Two things at PARC have changed: One is that we've moved from the periphery of the company to becoming an in-

tegrating force for the corporation. We've become the bridge from the digital copying world to the document world. That's a major event.

The second change is that we no longer operate in isolation. Before, a technology transfer meant throwing it over the transom to line divisions. Now we play a much greater role in shaping the corporate strategy. So you find a corporate long-term strategy that is informed by research as much as research is informed by the long-term corporate strategy.

In the old days, in most corporations, research worked on a 10-year time frame; engineering worked on a 10-month time frame. There's a real mismatch between these two time scales.

Q Do you have an example of how you've smoothed out that mismatch?

A Look at the Paperworks software product. Its current rendition is a small piece of software, [but we see it as a] first example of ubiquitous computing.

All of a sudden, every fax machine becomes a portal to my workstation. Wherever I am — I travel all the time — I can get any document I want at any time I want without a secretary by being able to fax these smart documents to my system, have it get interpreted in the system and have the system fax back relevant things.

It's a product that came out of PARC in less than a year. With that we've launched an entire new business division within the corporation that's 100 feet away from PARC's offices.

Q Are there other changes occurring at PARC?

A We're looking at technology transfer as much more of a dialogue or conversation between research and line organizations and our lead customers. Ideas don't necessarily get formed just in the head; amazing innovations really come from the world. So that's a different spirit, rather than the one that says we always know best, us vs. them. It's now a question of partnership, of co-production.

At the same time, there's been a return to the belief that our particular value-added to the corporation comes from challenging sacred cows, challenging background assumptions and thinking out of

the box. I call that "pioneering research" or "radical research." It looks to be connected to real problems on one hand, so we expect our researchers to be marinating in the real problems of the corporation. But on the other hand, they should have the absolute freedom, if not the responsibility, to step back out of that marination and to think radical thoughts, to reframe the problems, to look for the fundamental core of the problems. That's a different kind of spirit.

Q Has Xerox gotten over PARC's reputation for creating innovative technology that others used to succeed?

A PARC would not be a crucial element for [Xerox CEO] Paul Allaire if we had not produced a fair amount of stuff for the corporation.

People overlook the fact that there is an amazing computational infrastructure that comes from PARC. Today, every copier has graphical user interfaces from PARC. Most of them have Ethernets inside them, distributed computers inside them. There is a myth here that's a little bit misleading. [Take, for example, the idea that Steve Jobs turned PARC ideas into Apple products.] Very few people in the PC world realize that we held a percentage of Apple when Steve Jobs came to PARC. So when Jobs came into PARC, we were aware of Apple.

Q So the prevailing story, that Jobs snooped around and found technology to use for the Macintosh, is misleading?

A Absolutely. We never intended to go into the PC business but into distributed computing. He wanted to go into PCs. So it was not that nonsensical to let him see some of the technology. •

The cost of having a vision

For John Seely Brown, the title of "visionary" isn't necessarily a comfortable one. Vision, he explains, may come more easily to those who have access to all the right resources:

"I came from Bolt Beranek and Newman and the DARPA community, where you tend to use million dollar machines as personal machines. Quite honestly, some of the accomplishments of PARC are much less spectacular if you remove the cost constraints.

"When you have a \$1 million personal computer, you start to think and do things differently. And what seems to be so visionary is often an issue of removing cost constraints.

"Did PARC or Alan Kay invent personal computing and make it catch on? The same could be asked about the father of spreadsheets or word processing. Those guys showed you could do amazingly useful things in 4K and 8K machines. To me, they were as visionary as the rest of us. We get more of the credit. We could think bigger thoughts because we used bigger machines."

EXECUTIVE TRACK

In a special ceremony held late last month, **Spain W. (Woody) Hall Jr.** ascended to the post of executive director of the **U.S. Air Force's Standard Systems Center** located at Maxwell Air Force Base's Gunter Annex in Gunter, Ala. Hall, who has been a member of the Air Force's Senior Executive Service since 1988, becomes the first civilian ever to head the center, which supplies all major Air Force, **U.S. Department of Defense** and other federal agency commands and bases worldwide with computer system design, development, acquisition, maintenance and management.

Hall's installation was followed by a retirement ceremony for his predecessor, Brig. Gen. **Rick Zehrer**, whose retirement ends three decades of military service.

Effective Sept. 10, **The Washington Post** will have a newly created position — vice president of technology — and a newly promoted executive to fill it: **Ralph Terkowitz**, who has served as vice president of data processing at the Washington, D.C.-based newspaper since 1986. Terkowitz joined the paper 10 years earlier as a computer programmer and has held several information systems positions since then.

In Walnut Creek, Calif., **Delbert Yamaki** has joined **Bank of the West** as vice president and applications manager in the systems and programming department. Yamaki was formerly a systems manager at **Citibank**. His new post is with one of California's oldest banks, which was founded in 1874 and has 100 branches.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Nell Margolis, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Keeping pace with CASE philosophy

Systems development managers rub elbows with key business-side execs

BY KIM S. NASH
CW STAFF

Sure, we already know that chief information officers hobnob with core executives on the business side of the house. But increasingly, systems development managers are joining that strategy-setting inner circle.

One striking side effect of the move to computer-aided software engineering (CASE) and the industry's new emphasis on re-engineering the business seems to be a boost in software builders' prestige.

These days, at companies such as Levi Strauss & Co. and Otis Elevator, Inc., application development leaders are showing up on high-level executive committees and helping to map their firms' strategic direction.

Development managers say that along with the tools of their trade, the philosophy behind it has changed and has propelled them to greater prominence.

"People who see CASE or oth-

er application-building products as [nothing but] tools are short-sighted," says Donna Rund, director of information engineering at Levi Strauss.

Three years of using CASE methods have brought Rund's development team and the firm's senior management together to craft a global architecture, she says.

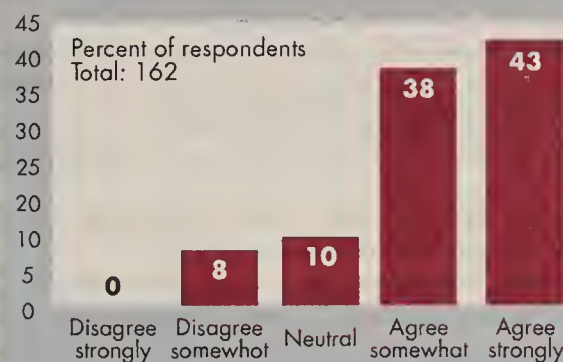
Rund participates in a cross-functional management group that
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Development difficulties

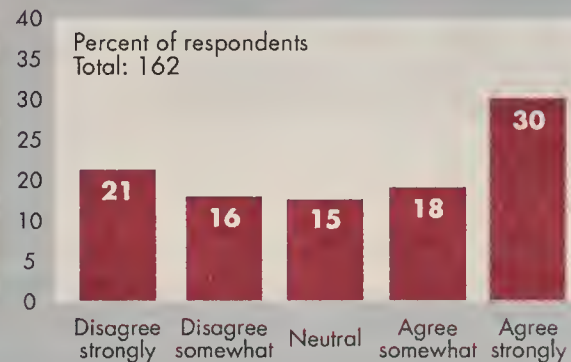
Coping with interdepartmental changes and those affecting the entire business are formidable challenges for systems development managers

Transforming the systems development culture is one of the greatest challenges facing the systems development manager



Source: CSC Index, Inc.

Changes in the business environment have required us to reorganize the systems development unit in the last 12 months



CW Chart: Janell Genovese

Honey, I blew up the outsourcing contract

BY NELL MARGOLIS
CW STAFF

Six months after signing a contract to outsource its mainframe-based, nationwide data processing functions to a professional management firm in order to concentrate its own information systems resources on more strategic application development, Homeland Stores, Inc. learned that its outsourcer was on its way out of business.

That is the stuff an IS director's nightmare is made of.

But William Rulla, Homeland's IS director, said he is not planning on any sleepless nights.

Homeland — an approximately \$30 million, 115-store grocery chain — has two safety nets on which to rely, he said.

For starters, it has its vendor's

pledge of support. Homeland's data processing is outsourced to Dallas-based Kimberly-Clark Computer Services, Inc., a wholly owned subsidiary of \$6.8 billion paper products giant Kimberly-Clark Corp. Recently, Kimberly-Clark decided to pull the plug on the 3½-year-old company, which was spun off in 1988 with lofty goals of gaining its parent a beachhead in the booming outsourcing and software development markets that apparently never quite materialized [CW, Aug. 10].

However, while ongoing business has ceased at Kimberly-Clark Computer Services, and approximately 80% of its work force has been laid off, the company is maintaining a large enough cadre of employees to honor all outstanding commitments to customers, a spokeswoman said earlier this month.

That promise of ongoing support, Rulla said, has been specifically reiter-

ated to Homeland — Kimberly-Clark Computer Service's sole external outsourcing customer. The outsourcing arrangement, under which Homeland migrated from its IBM mainframe-based shop in Oklahoma City to a Kimberly-Clark data center in Neenah, Wis., "has been going just fine," Rulla said. "We expect that to continue."

And if it does not, he added, Homeland will fall back on its second layer of security: a hefty penalty clause in its outsourcing contract. Rulla declined to reveal the dollar figure specified, but noted, "It's very big; let's just say, it's big enough so that if it comes into play, I'll smile all the way to the bank."

One former Kimberly-Clark executive, who requested anonymity, speculated that the Homeland penalty clause is a driving force behind Kimberly-Clark's resolve to keep an able support force at Kimberly-Clark Computer Services, even as the subsidiary effectively shuts down. "Believe me," the executive said, "they're going to go a long way to avoid having to confront that [penalty clause] in court."



CIOs pushed to prove gains

BY NELL MARGOLIS
CW STAFF

An alarming number of firms that spent the 1980s investing to the hilt on information technology are getting a rude awakening in the 1990s, according to

Harvard Business School assistant professor Gary Loveman. "When they ask, 'Where is the productivity gain from our investment,'" Loveman said, all too often the answer is, 'Darned if we can find it.' "

This stark assessment echoes

the findings published recently by research and consulting firm Ernst & Young. According to the firm's annual banking survey, banks that invested some \$14.1 billion in technology in 1991 alone are having a hard time tracking the investment into

productivity gains [CW, Aug. 3].

This may be one of the scariest ideas to stagger out of the lab since Dr. Frankenstein forgot to tie his research down. And information systems chiefs, according to search firm executive John J. Davis, are among the first to feel the monster breathing down their necks.

"Until recently, visionary CIOs — strategists — were in

great demand," noted Davis, whose New York-based firm, John J. Davis & Associates, specializes in executive searches in the IS area. "Now, the emphasis is shifting sharply to a proven ability to deliver."

Davis noted that chief information officers can draw some fairly pointed conclusions about what corporate management expects of them based on what comparable firms in search mode are looking for in their new IS chiefs. And regardless of the company's particular business niche, the shift from dreamers to doers is clear, Davis said.

"It isn't that the emphasis has shifted away from technology — it hasn't," he said. Rather, firms are coming to view technological acumen as necessary but not sufficient. It is a mix of attributes that Davis said "increasingly appears in mission statements of CIO posts." Some of the other attributes include the following:

- Sensitivity to basic business issues, especially those relating to customer service and operating efficiencies.
- A proven record of close involvement with day-to-day business activities.
- A history of bringing in projects on time and on, or under, budget.
- A bottom-line approach to replacing old technology infrastructures and doing it without hurting customer service.
- The ability to perform in a business environment that regards technology as one of many answers to business challenges and not always the best answer.
- Expertise in keeping staff trained in an ever-broadening array of technologies.
- Team building and interpersonal skills.
- Communications skills that operate at all organizational levels.
- A knack for delivering on the greatest number of the foregoing "druthers," all with a leaner staff and budget than the CIO used to have.

A daunting wish list indeed, but CIO aspirants do not have to fear that only Superman need apply, Davis said. "There are always trade-offs in our business," he noted, "and companies are realistic enough to know that no one will manifest all of the qualities they're looking for." Nevertheless, he added, the smart CIO will not disregard what is clearly the writing on the IS shop wall.



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Keeping pace with CASE philosophy

CONTINUED FROM PAGE 81

includes people from corporate planning and the company's executive management committee.

"If development groups see their job as simply moving to client/server architectures or learning object-oriented techniques, then the long-term strategy of the business will suffer," says Nicholas Vitalari, vice president of CSC Index, Inc., a consulting firm in Cambridge, Mass.

CASE taught Levi Strauss that "painful" lesson, according to Rund. The \$4 billion San Francisco-based firm bought KnowledgeWare, Inc.'s tools in 1989 with the goal of applying CASE to a larger business mission, instead of using it simply as "a way to program a pile of code," Rund says.

However, even with that understanding from the start, CASE "really pointed up our deficiencies in business knowledge," she says. For example, in order to effectively design new systems, designers and programmers at Levi Strauss had to get closer to the users to learn how and why tasks were done.

"Since we started CASE, users have had a buy-in to our projects, which was not the way we traditionally worked," Rund says.

Levi Strauss is not alone. In CSC Index's 1992 Summit Sur-

vey of systems development directors, the more than 350 respondents cited "identifying and developing strategic information systems" among their Top 10 most pressing concerns.

Share of limelight

Application development groups are entering the limelight as business re-engineering gains momentum, agrees James Wetherbe, director of the MIS Research Center at the University of Minnesota. The same business trend that is focusing attention on developers is making them an increasingly business-savvy crew, he adds. Systems developers are learning skills pertaining to business, political dynamics and creativity along with the latest coding techniques, says Wetherbe, who helped devise CSC Index's third-annual survey.

"In the 1970s, we replicated manual procedures. Now we change and direct the business," Rund agrees.

Recognizing and acting on the difference between automating history and bringing radical change to an organization is where smart systems development leaders will set themselves apart, observers say. At Ultramar Canada, Inc., a petroleum refinery in Toronto, systems designers are continually cultivat-

ing business acumen, according to Ian Wickins, supervisor of wholesale systems.

"We're showing the business people ways to improve functions," Wickins says, citing a point-of-sale (POS) system in-

stalled last year at the suggestion of IS. He says that his team, which designed and wrote the POS applications, showed management that doing tasks such as credit card processing and order tracking on-line would cut down on paper outlay and save money.

The more than 90-member development staff is not an equal with business-side high-ups,

Wickens says, "but we have made inroads, and largely because of innovative thinking."

Egalitarianism appears to be the rule at Farmington, Conn.-based Otis Elevator. Its entire roster of 8,000 North American employees is currently undergoing training in studying, streamlining and devising business functions, new and old.

The initiative is part of a plan to unify operations in the 163 countries where Otis does business. A Quality Leadership Team of IS and business managers is identifying and re-engineering common business tasks, says Peter Cobin, manager of technical analysis.

Speaking same language

Integral to that strategy is making application development more cohesive, Cobin says. Toward that end, the different divisions each blueprinted a business model that showed which functions were automated and which were not.

"Everyone from IS to accounting talks the same lingo now," Cobin says.

Observers agree that development skills of the past do not meet many of the problems facing IS shops today. Most notably, systems developers — not just top-level IS executives — need vision, CSC Index's Wetherbe says. "They need to be able to look at the same thing and see something different, which is what re-engineering is about."

Systems development critical issues for 1992

Timely response to systems requests has always been a high priority; this year it's No. 1

Top 10 Issues - North America	1992	1991	1990
Rapidly responding to system requests	1	3	4
Increasing developer productivity	2	1	5
Identifying and developing strategic information systems	3	2	3
Developing an information architecture	4	4	1
Dealing with maintenance, systems obsolescence and migration to new systems	5	5	8
Demonstrating the value of development projects to senior executives	6	8	11
Instituting a formal total quality management program in systems development	7	7	NR
Achieving support for cross-functional systems	8	6	2
Developing and implementing metrics for systems development	9	13	17
Managing end-user systems development	10	10	19

Survey of 216 systems development executives

Source: CSC/Index, Inc.

CALENDAR

AUG. 23-29

Interex Users Conference. New Orleans, Aug. 23-27 — Contact: Michelle Pettigrew, Interex, Sunnyvale, Calif. (408) 738-4848.

SynOptics User Group Conference. Washington, D.C., Aug. 24-26 — Contact: Dennis Farr, SynOptics User Group, Santa Clara, Calif. (408) 988-2400.

Marketing the IS Organization Internally. Chicago, Aug. 25-26 — Contact: The Ouellette & Associates Registrar, Bedford, N.H. (603) 623-7373.

Auto-Tech. Detroit, Aug. 25-27 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

Downsizing Expo. San Francisco, Aug. 25-27 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Cohesion Conference. Boston, Aug. 26-28 — Contact: Stephanie Vickers, BIS Strategic Decisions, Norwell, Mass. (617) 878-6650.

Computerfest '92. Dayton, Ohio, Aug. 29-30 — Contact: Mark Hanslip, DMA Computerfest, Dayton, Ohio. (513) 263-3378.

AUG. 30-SEPT. 5

Primavera Systems, Inc.'s Ninth Annual User Conference. Philadelphia, Aug. 30-Sept. 2 — Contact: Primavera Systems, Inc., Bala Cynwyd, Pa. (215) 660-5830.

Surface Mount International Conference. San Jose, Calif., Aug. 30-Sept. 3 — Contact: SMTA, Edina, Minn. (612) 920-7682.

International Training Conference & Exposition. Anaheim, Calif., Aug. 31-Sept. 2 — Contact: Russell F. McKinnon, Trade Associates, Inc., Rockville, Md. (301) 468-3210.

SEPT. 6-12

Rocky Mountain Computer Conference and Exposition. Denver, Sept. 8-10 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

SEPT. 13-19

Buscon '92/East. Boston, Sept. 15-17 — Contact: Buscon '92, Norwalk, Conn. (203) 852-0500.

DOD-STD Conference. Washington, D.C., Sept. 15-17 — Contact: David Maibor Associates, Inc., Needham, Mass. (617) 449-6554.

Crystal Ball '92. San Diego, Sept. 17-19 — Contact: Acucobol, San Diego, Calif. (619) 689-7220.

DevCan '92. Phoenix, Sept. 18-23 — Contact: Microsoft Fox, Inc., Perrysburg, Ohio. (800) 927-6368.

SEPT. 20-26

Sapphire '92. Orlando, Fla., Sept. 20-23 — Contact: Sylvia Bauer, SAP Canada, North York, Ontario. (416) 229-0574.

Pen-Based Expo. Los Angeles, Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Image World. New York, Sept. 21-25 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, New York. (914) 328-9157.

York (914) 328-9157.

Virtual Reality '92. Westport, Conn., Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

The Fifth Annual New England Computer Operations Conference. South Portland, Maine, Sept. 24-25 — Contact: Jerome Lemelin, Portsmouth Naval Shipyard, Portsmouth, N.H. (207) 438-2815.

SEPT. 27-OCT. 3

Sensors Expo's Seventh Conference. Chicago, Sept. 29-Oct. 1 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept. 29-Oct. 2 — Contact: Computer Intelligence, La Jolla, Calif. (619) 450-1667.

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association (SPA) Annual Conference. Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, New Mexico. (505) 986-0523.

Mexico (505) 986-0523.

Repository Ad/Cycle International Users Group Conference. Chicago, Oct. 4-7 — Contact: Repository Ad/Cycle Group, Santa Monica, Calif. (310) 394-8305.

Electronic Data Interchange Associa-

tion (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

Scan-Tech '92. Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8588.

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COMPUTER CAREERS

IS jobs in vendor firms: A taste of cutting edge

Working in the information systems department at a company that makes hardware or software can have big pluses, such as seeing prealpha software or having the latest hardware long before the rest of the world. But when you scrape the icing off the cake, these companies view them-

selves as "just another manufacturing company" with many of the same career challenges.

Chet Lakhani, vice president of information services at Irvine, Calif.-based AST Research, Inc.; Bruce Runyan, vice president of IS at Borland International, Inc. in Scotts Valley, Calif.; and Tom Minick, director of IS at the Apple Products Division, recently shared their views on IS career opportunities in vendor companies with Kelly E. Dwyer, assistant editor, features.



AST's Lakhani: Programmer/analysts are in demand

What's it like to work in IS at a vendor company?

•Runyan: When you get down to it, we're a manufacturing company, just like anyone else. But we get to play with the new stuff and set direction. We also use our MIS group to try out software. I

think I'm pickier than most people. If Borland can't sell to me, we're never

going to sell to corporate IS departments.

•Lakhani: Everyone is well-versed in an IS area. The quality of our information systems gets better because we have better input. These people are familiar with what the systems can do or cannot do.

•Minick: The minuses are obvious. Trying to build systems for some of the best technologists in the industry is a difficult thing. Everyone's got an opinion; in fact, the joke is that we have 14,000 systems analysts in the company. I think the standards are much, much higher because the demands of technical people are very extreme.

The advantage is that Apple is a very exciting company. We see and use and play and have access to technology well before other *Fortune* 100 companies.

What jobs are in demand?

•Runyan: I see two career paths. One is the business analyst, business generalist person, who's coming through for more technical education to find out how things work and what goes on in the back room. The other is high-end technology people. That's

where I think the future is moving.

•Lakhani: Long-term demand will be in the area of people who are programmer/analyst types — not strictly programmer or analyst (as the IBM environment used to have) but the hybrid kind ... business people with technical skills.

•Minick: Probably the highest demand I see in the future would be in the area of architecture, modeling and advanced business analysis.

What skills do recent hires have?

•Lakhani: During the last 18 months, hires are local-area network specialists, end-user support people and data communications people who can help me establish wide-area networks.

•Minick: In my organization, we have filled mostly programming positions, principally microcomputer programming, specifically Macintosh. But the kinds of programming are a lot different than in the past. These are people that have skills in C and object technique and can program on both minicomputers and microcomputers.

At a company level, we've brought in a lot of data modelers, a number of systems architects (and continue to do that) as well as generalist and business analysts — people who partner with our users.

Can you offer real-world advice?

•Runyan: You've got to be flexible and focus on your customers. You won't last long if you're in IS for just

the job of coding.

•Lakhani: The people who want to make a career in IS are much better off getting exposure to as many software packages as possible. It builds your business base and also gives you insight into how other people help solve some real issues.

•Minick: I think every person who wants to make IS their career should expect to spend at least two to five years of their careers outside of IS so that they understand the business that they're supporting. The technical skills are learnable; the business skills are not.

A typical career path would be five years in systems and two years out of systems, another five years in and two more out. Go into sales, marketing or support to learn to deal with customers and learn communications skills. I can't emphasize enough the business side of things — learning the business, understanding it, being able to communicate like our customers.

I would definitely learn modeling and architecture — it's a new emerging field and I'd spend time in it. Understand small computers and desktop computers. That's where the future is. It's not in the big iron that it's been in in the past. Of course, I'm not completely objective on that.



Apple's Minick: I can't emphasize enough the business side of things

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JOB CLOSE-UP

Switch into client/server calls for broad background and bravery

BY CANDEE WILDE
SPECIAL TO CW

Programmers making the shift to client/server environments say they feel like Lewis and Clark on an expedition without a guide. The main reason: a lack of skills outside mainframe or stand-alone personal computer environments.

"A lot of new people coming in have only PC experience and have never worked in an IS shop," says Michael Proto, an office database manager at Pacific Gas & Electric Co. "They don't know the control procedures and testing rigor that a formal shop expects in critical application development."

Proto, a former mainframe programmer, says working with the new technologies has required some changes in thinking. Indeed, the skills for positions in the client/server world — ranging from application development analyst to systems analyst to senior systems analyst — call for a broad background.

For instance, Proto says he values his experience in a "more constrained" environment of traditional information systems be-

cause he says an IS background discourages the shoot-from-the-hip approach to solutions that PC purists often seem to exhibit.

Retraining adds up

Forrester Research, Inc. in Cambridge, Mass., estimates that Fortune 1,000 companies will spend more than \$5 million in time, salary, materials and other costs to

THOSE WHO are well-versed in both mainframe and client/server will be a greater asset to companies making the transition to smaller platforms.

retrain IS staffs for client/server environments.

For mainframe-oriented workers, retraining can be worth the effort: Salaries for client/server-related positions range from \$35,000 to \$80,000, depending on experience and job title.

Consultants and IS managers say three to five years of develop-

ment experience in a corporate environment (not necessarily in client/server) is crucial for those looking for employment in this new arena.

In addition, Forrester recommends that hopefuls have knowledge of multiple platforms, rapid application development tools, object-oriented principles and relational databases.

Proto adds that "paying your dues in a large organization for a year or two is a worthwhile experience. I took some computer classes in 1980 when I made the transition to computers, and my impression was that the classes didn't match the realities of the corporate computing environment."

Indeed, IS managers say hands-on experienced is preferred over classroom training.

While many programmers are leaping enthusiastically into this new world, some Cobol programmers are resisting the new technology. Even entire companies may be slow to catch on.

Denise Davis, vice president of IS at VASA Insurance Group, Inc., says the 250-person Indianapolis-based insurance underwriting company failed to recognize the importance of retraining

programmers for a mission-critical client/server environment.

She adds that the company had to bring in outside consultants to provide training.

One of those former consultants, Brian Lohss, says analysts must learn more than just the details of how products and software work.

For example, Lohss' current position as VASA's director of systems and programming requires him to work closely with senior management doing strategic planning and get hands-on experience with code.

Although delving into computer code might not appeal to everyone, Lohss said he likes it. He particularly enjoys combining "high-level strategic planning for future implementation of client/server architecture in our organization and the day-to-day of how something works."

Proto is responsible for the infrastructure surrounding SQL Server. He helps end-user departments develop applications and oversees certification of the product on the network. He also facilitates information sharing and identifies and reviews other products that will work with SQL Server.

One difference for many mainframe operators switching to client/server environments is the heavier involvement with us-

ers. John Adler, MIS director at Trans National, Inc., a travel agency based in Boston, says sitting down with end users to hammer out system wants and needs is one of his favorite parts of the job.

Adler says he does not find the complexity and breadth of options available with client/server systems frustrating. Instead, he views them as a challenge that often requires bringing "specialized people into the picture."

Adler also stresses the importance of being able to explain to senior management, in terms of time and money, how and why the new technology will benefit the

company.

What advice do IS managers have for people hoping to grow in this field?

Become well-versed in both mainframe and client/server areas, Lohss says, so you'll be a greater asset to companies making the transition to smaller platforms.

"The person most valuable is somebody who has the desire to learn the client/server environment but has the flexibility to go back and do work on the mainframe when it is appropriate," he says.

Wilde is a free-lance writer based in Easton, Conn.

CAREERS in Client/Server

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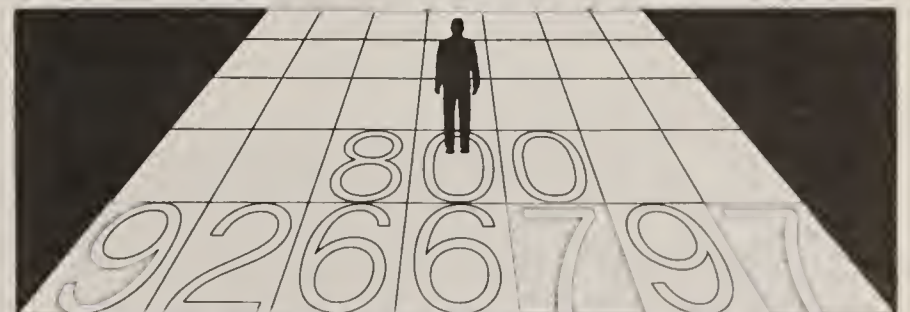
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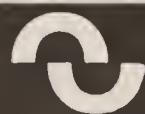
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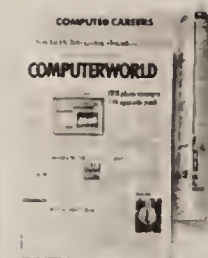
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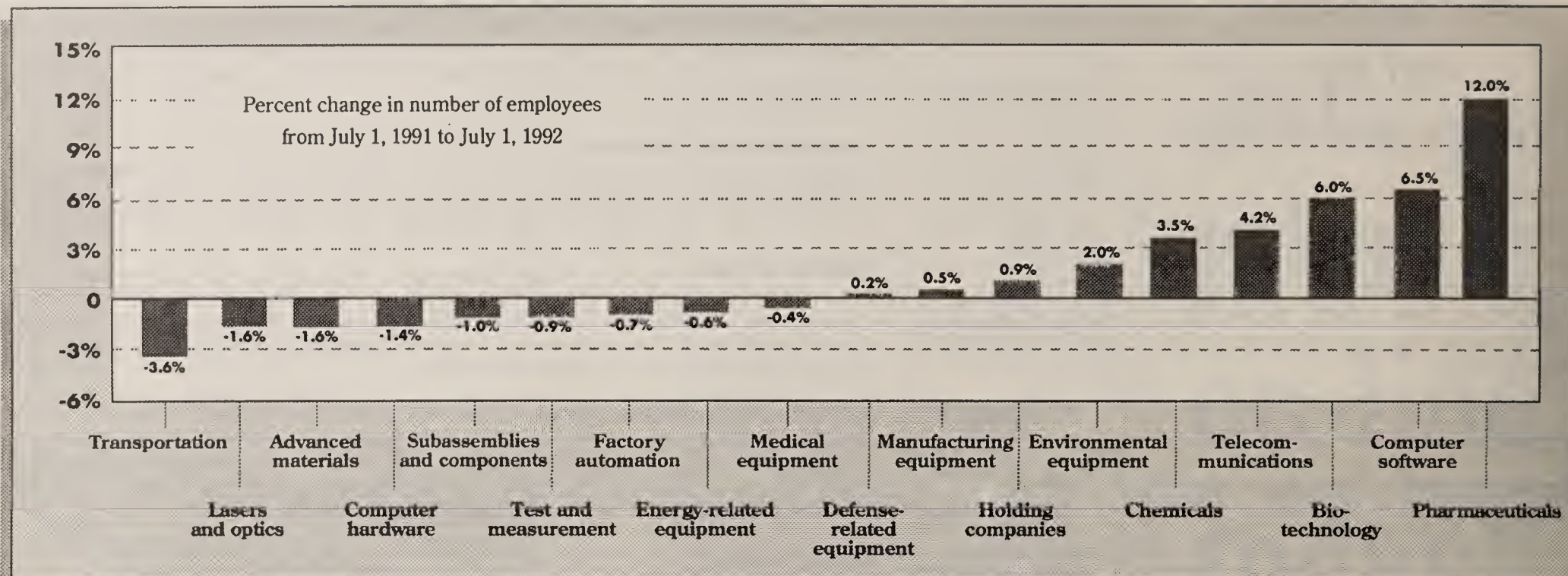
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SPECIAL TO CW

Imagine a phone that constantly rings — one user after another complaining about network response time or that ubiquitous error message on a computer screen, “file server not found.”

For local-area network administrators, there's nothing “imaginable” about it — it's their job. That's why most of them are constantly in search of tools that can make their job easier.

While the perfect self-contained solution hasn't arrived yet, LAN administrators contacted recently were able to respond quickly when asked to name the tools they wouldn't want to live without.

•Cable testers. Wires and cables may look innocuous, but more than 50% of LAN downtime is traced to cabling and physical connections.

That's why, when a LAN segment is down, LAN administrators grab their cable testers.

Once it is plugged into the network, the tester scans for where the cable in question is hiding out. It helps pinpoint and rule out any physical sources of network trouble by measuring cable length, resistance, noise and distance to faults.

Vahe Katros, network manager at Bentley College in Waltham,

Mass., relies on Next Scanner from MicroTest, Inc. in Phoenix. The handheld device costs approximately \$3,000.

According to Katros, the cable tester is indispensable and is the only way to determine if LAN faults are in the cable without spending hours restringing cable segments.

•Monitoring tools: One is not enough. Wiring is only one aspect of a LAN, and traffic is another. For keeping tabs on what trav-

els over the network, the tool of choice is a monitor.

These tools report on the activity of network devices and signal changes in traffic patterns so that bottlenecks can be avoided before they occur. LAN monitors have almost become a commodity, differentiating themselves mostly by how they present the data.

While some simply collect information and spit it out, newer monitors promise to save the LAN administrator time by processing the statistics into a more digestible form.

Much to the dismay of most LAN managers, however, the intricacies of the network demand that they use more than one monitoring tool.

Dwight Lubansky, senior electronic engineer at Ciba-Geigy Corp. in Summit, N.J., needs to interconnect the various segments of his network. So he depends on three separate monitoring devices from Digital Equipment Corp. that sit between each segment and monitor traffic.

While the DEC tools have served him well, Lubansky is searching for multiprotocol monitors designed for Transmission Control Protocol/Internet Protocol environments.

“Right now we're evaluating Trakker,” a LAN monitor from Concord Communications, Inc. in Marlboro, Mass., Lubansky says. Although Trakker is a rela-

tively new tool on the market, Lubansky says he likes what he's seen so far — especially its “ability to look into the upper protocol layers and see through routers.”

•Tools for mundane tasks. Everyone loves utility products that help make performing repetitive, mundane tasks easier.

Usually, these utilities are focused, small pieces of inexpensive software that generally cost less than \$300, depending on the number of users.

Dave Von Colln, manager of end-user support at NASA in Washington, D.C., is always on the lookout for these products. Part of his job is to manage the applications running on a 150-node Novell, Inc. network, including the tedious task of debugging applications.

More often than not, Von Colln says he finds users are the source of application bugs. Much to his relief, Von Colln says the instances of user-induced bugs have dropped dramatically since he installed PC/DACs, a front-end security package from Pyramid Development Corp. in Rocky Hill, Conn.

“To get onto our network now, you have to log onto PC/DACs,” he explains. “This prevents viruses from entering and also keeps out intruders.”

The utility protects all executable files, thereby preventing us-

ers from making unauthorized changes to the software environment.

David Dingley, a PC/network support specialist at Andersen Consulting in Philadelphia, notes that many of these types of tools are not expensive, and some are even free.

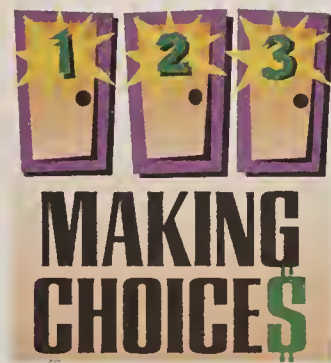
“There's an abundance of shareware and public utilities that simplify tedious tasks, from setting passwords to doing print management,” Dingley says.

He downloads tools regularly from CompuServe, Inc. and other services. “On a monthly basis, Novell uploads driver updates and new versions of software ... such as file server monitors,” Dingley says.

•Home remedies. Some users end up writing their own tools to fill in the gaps.

“We have lots of in-house developed utilities and tools that either enhance existing products or replace features they lack,” explains John Lhota, manager of Network Computing Systems at Barnett Technologies, Inc. in Jacksonville, Fla.

Huntington-Lee is principal at Brandywine Network Associates in Cinnaminson, N.J., and a member of the Association for Computing Machinery.



Tools developed in-house can fill gaps left by standard off-the-shelf LAN administration products, but roll-your-own software doesn't always cost less than commercial tool packages. According to a study by Infonetics Research, Inc., building your own LAN tools can cost 3 to 29 times more than purchasing equivalent functionality from a vendor. Unfortunately, it's the only choice for some applications.

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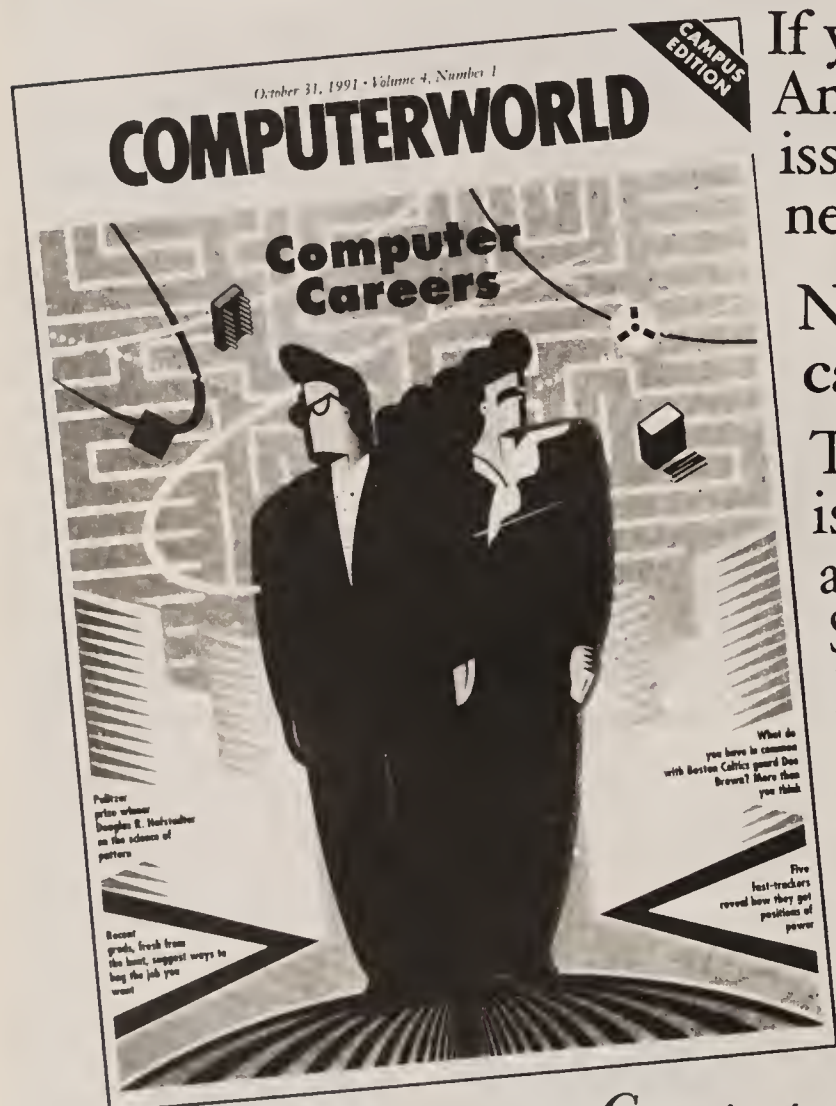
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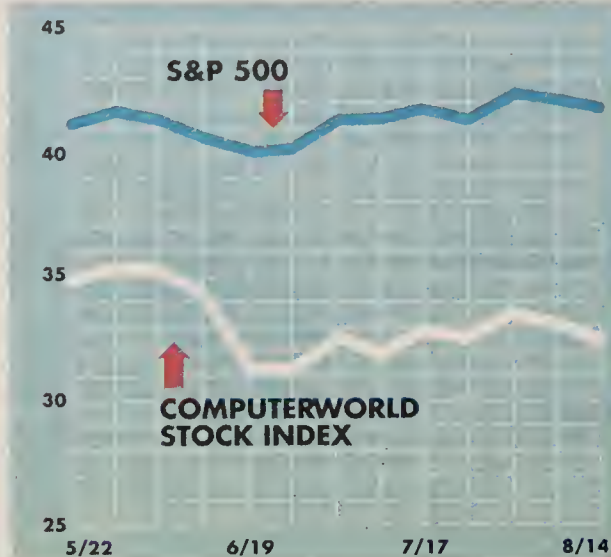
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STOCK TRADING INDEX



Industry Almanac

RECOMMENDATION CHANGES

UPGRADED FROM BUY TO STRONG BUY: Synopsys, Inc. (Alex. Brown & Sons, Inc.). The fiscal third quarter garnered slightly better than expected results for Synopsys (SNPS), compared with the third quarter last year. The electronic design software vendor reported \$16.1 million in sales and \$12.4 million in profits during the third quarter of 1992.

The company recently introduced Synthesis Version 3.0, a product that should broaden Synopsys' share of the synthesis market. Version 3.0 was designed to perform multiclock cycle design, which would help produce higher quality chips faster. Version 3.0 can reportedly create chip designs that cannot be done by hand. Look for Synopsys to continue to reap benefits from an industry trend toward increased processor complexity.

DOWNGRADED FROM BUY TO NEUTRAL: Autodesk, Inc. (Alex. Brown). After the resignation of Autodesk (ACAD) President Alvar Green, the firm appointed Carol Bartz, former executive at Sun Microsystems, Inc. (SUNW), as chairman, president and chief executive officer. The company's new management needs to focus attention on an updated version of AutoCAD Release 12, a drafting package that was introduced 10 years ago.

Although Autodesk introduced other products at the same time, AutoCAD has been extremely successful for the company. There are some indications that AutoCAD's unit growth rate is flattening, but the product accounted for nearly 90% of the company's revenue.

DOWNGRADED FROM BUY TO HOLD: Symantec Corp. (Prudential Securities, Inc.). Sluggish sales of Symantec's (SYMC) DOS-based applications and utilities are a direct result of personal computer users shifting to Microsoft Corp.'s (MSFT) Windows environment more quickly than anticipated.

Despite Symantec's past success in the DOS arena, the company's lack of Windows-based products will likely stunt near-term growth. However, long-term growth looks a bit more promising, as long as Symantec's new products are rolled out on time and reach previous levels of market acceptance.

LISA DAVIDSON

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, AUGUST 14, 1992

TOP PERCENT GAINERS

OMS Inc.	19.70
Sequoia Systems Inc.	13.04
Software Toolworks Inc.	12.52
Intelligent Electronics	10.96
Corporate Software (L)	10.71
Easel Corp.	10.34
Cheyenne Software Inc.	9.38
Wellfleet Communications	8.50

TOP PERCENT LOSERS

Dataram Corp.	-48.78
Wang Labs Inc. (b)*	-33.33
American Software Inc.	-30.63
Data Switch Corp.	-21.85
Gateway Communications	-18.54
Gandalf Technologies Inc.	-18.18
Systems Center Inc.*	-16.13
Micrografix Inc.	-14.67

TOP DOLLAR GAINERS

Wellfleet Communications	3.25
Informix Corp.	2.75
Borland Int'l Inc.*	2.13
Synoptics Communications	2.00
Novell Inc.*	1.88
Parametric Technology (H)	1.88
Southwestern Bell Corp.	1.88
Nynex Corp.*	1.88

TOP DOLLAR LOSERS

Dataram Corp.	-7.50
Matsushita Electronics (L)	-4.88
American Software Inc.	-4.25
Storage Technology* (L)	-4.25
Exabyte	-3.75
System Software Assoc.	-2.63
Stratus Computer Inc.*	-2.13
Rainbow Technologies Inc.	-2.00

Exch 52-Week Range

Aug. 14 Wk Net Wk Pct
Close Change Change

Communications and Network Services Off 1.18%

OTC	15.00	6.75	3 COM Corp.*	11.00	-0.38	-3.30
NYS	69.88	56.25	American Info Techs Corp.*	69.38	0.38	0.54
NYS	44.88	32.88	AT&T*	43.38	-0.25	-0.57
OTC	4.25	1.00	Artel Communication Corp.	1.25	0.00	0.00
NYS	50.63	40.25	Bell Atlantic Corp.	48.63	1.25	2.64
NYS	53.88	43.38	Bellsouth Corp. (H)	53.88	1.25	2.38
NYS	7.13	4.13	Bolt, Beranek & Newman	4.50	0.00	0.00
NYS	65.88	36.63	Cabletron Systems	54.00	-0.50	-0.92
OTC	31.00	16.50	Chipcom Corp.	25.25	-0.25	-0.98
OTC	53.75	18.63	Cisco Systems Inc. (H)	49.00	-1.13	-2.24
OTC	35.25	6.00	Compression Labs Inc. (L)	8.00	0.50	6.67
OTC	3.38	0.88	Data Switch Corp.	1.56	-0.44	-21.85
NYS	23.63	12.38	Digital Comm. Assoc.*	18.63	-0.25	-1.32
OTC	17.50	8.00	Digital Systems Int'l Inc.	9.00	0.00	0.00
OTC	7.00	3.63	DSC Communications	6.50	-0.13	-1.89
OTC	10.88	4.75	Fibronix Int'l Inc.	5.38	0.13	2.38
OTC	37.50	10.50	FileNet Corp.	13.50	-1.38	-9.24
OTC	3.38	1.13	Gandalf Technologies Inc.	2.25	-0.50	-18.18
OTC	2.25	0.69	Gateway Communications	1.38	-0.31	-18.54
NYS	5.50	2.13	General Datacomm Inds.	3.50	-0.25	-6.67
ASE	5.88	0.50	Go Video	3.00	0.00	0.00
NYS	35.63	28.13	GTE Corp.* (H)	35.00	0.13	0.36
NYS	70.63	50.00	ITT Corp.	66.75	-1.00	-1.48
OTC	36.13	25.25	MCI Communications Corp.	33.88	0.50	1.50
OTC	14.50	2.25	Microcom Inc.	3.75	0.13	3.45
NYS	18.25	9.50	Network Equipment Tech.*	10.63	0.25	2.41
OTC	25.50	6.75	Network General	10.00	-1.00	-9.09
OTC	20.00	8.50	Network Systems Corp.	11.00	-1.25	-10.20
OTC	17.88	5.50	Newbridge Networks Corp.	15.63	-0.50	-3.10
NYS	49.25	33.75	Northern Telecom Ltd.*	34.88	-0.88	-2.45
OTC	65.00	28.50	Novell Inc.*	50.75	1.88	3.84
NYS	83.50	69.13	Nynex Corp.*	83.38	1.88	2.30
OTC	37.50	16.50	Otel Communications Corp.	24.38	0.88	3.72
OTC	9.88	4.00	Penril Data Comm. Ntwks.	5.25	0.25	5.00
OTC	53.00	17.00	Pictoretel Corp.	18.75	1.25	7.14
OTC	18.75	9.75	Proton Inc.	13.75	-0.25	-1.79
NYS	26.75	11.63	Scientific Atlanta Inc.	26.75	1.00	3.88
NYS	67.25	51.50	Southwestern Bell Corp.	67.25	1.88	2.87
NYS	27.00	20.75	Sprint Corp.	23.00	-0.38	-1.60
OTC	13.75	4.00	Standard Microsystems Corp.	12.88	-0.13	-0.96
OTC	35.75	14.25	Synoptics Communications	35.75	2.00	5.93
NYS	40.00	32.88	US West Inc.	38.13	0.00	0.00
OTC	41.50	22.75	Wellfleet Communications	41.50	3.25	8.50

PC and Workstations Up 0.29%

OTC	15.00	4.50	Advanced Logic Research	4.50	0.00	0.00
OTC	70.00	41.50	Apple Computer Inc.* (L)	44.75	1.38	3.17
OTC	32.25	12.00	AST Research Inc.*	13.25	0.25	1.92
NYS	19.25	9.00	Commodore Int'l	9.25	-0.25	-2.63
NYS	36.75	22.13	Compaq Computer Corp.*	29.63	0.50	1.72
OTC	29.00	13.91	Dell Computer Corp.	24.00	1.25	5.49
OTC	7.75	2.13	Everex Systems Inc.	2.50	-0.19	-6.99
NYS	34.00	21.25	Harris Corp.	31.75	0.63	2.01
NYS	85.00	44.63	Hewlett-Packard Co.*	60.00	1.13	1.91
NYS	29.75	14.13	Silicon Graphics	22.13	0.75	3.51
OTC	35.88	20.75	Sun Microsystems Inc.*	25.75	0.75	3.00
NYS	31.25	22.50	Tandy Corp.*	24.25	0.25	1.04
NYS	11.13	5.13	Zenith Electronics	6.63	-0.25	-3.64
OTC	25.50	3.63	Zeos International Ltd.	3.63	-0.25	-6.45

Large Systems Off 3.02%

ASE	20.63	11.63	Amdahl Corp.*	13.25	-0.63	-4.50
NYS	16.13	7.50	Ceridian Corp.	15.38	-0.38	-2.38
NYS	16.38	5.75	Convex Computer	6.50	0.00	0.00
OTC	19.63	1.88	Cray Computer	3.38	-0.13	-3.57
NYS	52.25	23.25	Cray Research Inc.*	23.75	-1.38	-5.47
NYS	22.50	7.13	Data General Corp.	8.00	-0.38	-4.48
NYS	65.50	33.25	Digital Equipment Corp.*	37.88	0.63	1.68
NYS	106.38	81.63	IBM*	88.38	1.25	1.43
NYS	121.25	90.13	Matsushita Electronics (L)	90.13	-4.88	-5.13
OTC	19.75	9.50	Pyramid Technology	9.75	-0.25	-2.50
OTC	17.88	7.50	Sequent Computer Sys.	16.13	-0.38	-2.27
OTC	18.38	5.00	Sequoia Systems Inc.	6.50	0.75	13.04
NYS	54.25	34.13	Stratus Computer Inc.*	44.75	-2.13	-4.53
NYS	15.13	9.50	Tandem Computers Inc.*	10.88	0.25	2.35
NYS	11.75	3.63	Unisys Corp.*	9.75	0.13	1.30
ASE	7.50	1.50	Wang Labs Inc. (b)*	1.50	-0.75	-33.33

Software Off 2.45%

OTC	68.50	34.75	Adobe Systems Inc. (L)	37.63	1.75	4.88
OTC	13.25	2.50	AI Corp.	4.38	-0.25	-5.41
OTC	45.00	11.50	Aldus Corp.	13.38	0.13	0.94
OTC	19.75	9.63	American Software Inc.	9.63	-4.25	-30.63
OTC	20.00	8.50	Ask Computer Systems	14.00	-0.75	-5.08
OTC	57.25	23.25	Autodesk Inc.	40.50	-0.50	-1.22
OTC	37.75	8.25	Bachman Info. Systems	9.75	-0.50	-4.88
OTC	42.50	29.00	BGS Systems Inc.	38.00	0.75	2.01
OTC	79.00	37.25	BMC Software Inc.	47.75	-0.75	-1.55
OTC	20.50	9.00	Boole & Babbage	18.63	-0.88	-4.49
OTC	86.75	35.00	Borland Int'l Inc.*	43.38	2.13	5.15
OTC	11.25	3.63	CE Software	4.63	-0.25	-5.13
ASE	14.38	6.50	Cheyenne Software Inc.	13.13	1.13	9.38
OTC	20.38	7.25	Cognos Inc.	8.38	0.00	0.00

Exch 52-Week Range

Aug. 14 Wk Net Wk Pct
Close Change Change

NYS	17.00	7.50	Computer Associates*	14.38	0.00	0.00
OTC	21.50	8.50	Comshare Inc.	10.25	0.38	3.80
OTC	47.88	6.50	Easel Corp.	8.00	0.75	10.34
OTC	25.50	11.50	Group I Software	16.50	-1.00	-5.71
OTC	6.63	3.50	Hogan Systems Inc.	4.75	-0.38	-7.32
OTC	36.25	18.50	Information Resources	24.25	0.00	0.00
OTC	39.25	5.50	Informix Corp.	39.00	2.75	7.59
OTC	22.75	12.50	Intergraph Corp.	13.50	-0.75	-5.26
OTC	15.00	5.13	Interleaf Inc.	8.50	-0.25	-2.86
OTC	20.25	8.50	Intersolv Inc.	13.75	-1.25	-8.33
OTC	30.00	10.50	Knowledgeware Inc.	12.25	0.00	0.00
OTC	45.25	20.25	Legent Corp.*	40.00	-0.25	-0.62
OTC	40.75	15.50	Lotus Development*	17.38	0.13	0.72
OTC	7.38	1.88	Meca Software	2.25	-0.13	-5.26
OTC	22.25	6.50	Mentor Graphics	8.00	0.25	3.23
OTC	20.50	6.50	Micrografix Inc.	8.00	-1.38	-14.67
OTC	88.84	51.34	Microsoft Corp.*	71.00	0.25	0.35
OTC	21.13	8.88	Oracle Corp.*	17.88	0.00	0.00
OTC	41.50	14.75	Parametric Technology (H)	40.88	1.88	4.81
OTC	11.00	3.50	Phoenix Technologies	4.63	-0.25	-5.13
OTC	25.25	11.00	Platinum Technology	14.50	-1.50	-9.38
OTC	46.50	27.75	Progress Software Corp.	38.00	-1.50	-3.80
OTC	26.63	4.00	Quarterdeck Office Sys.	4.88	-0.63	-11.36
OTC	32.75	10.25	Rainbow Technologies Inc.	16.00	-2.00	-11.11
OTC	27.50	8.75	Rasterops	9.50	-1.00	-9.52
OTC	17.25	5.38	Ross Systems	7.63	0.38	5.17
OTC	26.25	7.50	Software Publishing Corp.	9.25	0.50	5.71
OTC	8.50	2.00	Software Toolworks Inc.	2.81	0.31	12.52
OTC	7.25	1.75	Spinnaker Software	2.75	0.00	0.00
OTC	16.50	6.25	State of the Art	6.50	-0.25	-3.70
NYS	25.25	12.13	Sterling Software Inc.	17.63	0.13	0.71
OTC	30.00	13.00	Struct. Dynamics Research	14.25	0.25	1.79
OTC	31.75	15.00	Sybase Inc.	28.63	-0.50	-1.72
OTC	51.00	16.75	Symantec Corp.	16.75	-1.88	-10.07
NYS	15.50	5.25	Systems Center Inc.*	6.50	-1.25	-16.13
OTC	34.25	8.66	System Software Assoc.	23.50	-2.63	-10.05
OTC	23.75	14.50	Walker Interactive Systems	16.13	-0.63	-3.73
OTC	6.63	2.13	Wordstar	2.50	-0.06	-2.46

Semiconductors Up 0.80%

NYS	21.50	7.38	Advanced Micro Devices	9.38	0.00	0.00
NYS	11.13	7.00	Analog Devices Inc.	10.00	0.13	1.27
OTC	13.88	6.75	Atmel Corp.	8.38	-0.13	-1.47
OTC	14.13	4.25	Chips and Technologies	4.50	-0.63	-12.20
NYS	22.63	7.38	Cypress Semiconductor Corp	9.25	0.50	5.71
NYS	10.88	6.25	Dallas Semiconductor (H)	10.50	0.25	2.44
OTC	68.75	38.50	Intel Corp.*	59.63	1.00	1.71
NYS	9.88	5.50	LSI Logic Corp.	5.88	0.00	0.00
NYS	22.38	11.13	Micron Technology	16.38	0.38	2.34
NYS	88.13	54.00	Motorola Inc.* (H)	85.50	0.88	1.03
NYS	11.50	3.88	National Semiconductor*	11.50	0.50	4.55
OTC	27.00	9.00	Sierra Semiconductor	9.00	-1.00	-10.00
NYS	42.38	26.00	Texas Instruments*	41.13	1.38	3.46
OTC	10.50	5.88	VLSI Technology	6.75	0.00	0.00
OTC	9.75	2.13	Weitek	3.25	0.13	4.00
ASE	5.63	2.00	Western Digital Corp.	4.75	0.25	5.56
OTC	32.50	17.25	Xilinx	22.50	0.50	2.27
OTC	11.50	4.63	Zilog Inc.	7.00	0.25	3.70

IN BRIEF

Profits up at Gateway

■ Bucking the personal computer industry trend, **Gateway 2000** last week said second-quarter pretax profits soared 97% from last year's comparable period. Second-quarter revenue also climbed 97% to \$248.6 million from last year's second quarter. The North Sioux Falls, S.D., firm said it shipped nearly 100,000 systems in the quarter ended June 30.

■ **Northgate Computer Corp.** posted a second-quarter loss of \$10.1 million, compared with a \$2.6 million profit in the same period last year. Revenue declined 22% to \$34.6 million from last year's second quarter. A controlling interest in the Fremont, Calif., mail-order house was recently acquired by a Herndon, Va., investment concern [CW, July 13].

■ Fledgling wireless local-area network products developer **Windata, Inc.** said it completed a second round of financing totaling \$5.75 million. New investors in the Northboro, Mass., firm include **Burr Egan, Delage & Co.** in San Francisco; **New Enterprise Associates** in Baltimore; and **Advent International Corp.** in Boston. Also anteing up were first-round investors **Bass Associates** in Palo Alto, Calif., and **Oak Investment Partners** in Menlo Park, Calif.

Short takes
Novell, Inc.'s board of directors has approved a two-for-one split of its stock for shareholders on record as of Aug. 26. ... Frank Dodge, co-founder of **McCormack & Dodge** and now head of client/server applications developer **The Dodge Group** in Waltham, Mass., has joined the board of **Bachman Information Systems, Inc.** in Burlington, Mass. ... **Computer Horizons Corp.** in Mountain Lakes, N.J., has named John Sisto president of its recently formed systems integration subsidiary.

Judge reaffirms ruling against Apple

Refuses to overturn decision that Microsoft's Windows infringes on key Macintosh elements

BY JAMES DALY and
CHRISTOPHER LINDQUIST
CW STAFF

SAN FRANCISCO — A federal judge has refused to reverse a 3-month-old ruling that has crippled Apple Computer, Inc.'s high-stakes copyright infringement suit against Microsoft Corp. and Hewlett-Packard Co.

U.S. District Judge Vaughn Walker denied on Aug. 7 Apple's request that he reconsider his judgment that 95% of Apple's 189 infringement claims are covered by a 1985 agreement between Apple and Microsoft.

The denial was the latest development in a case to determine whether Apple's Macintosh screen is subject to copyright protection.

Apple sued Microsoft and HP in March 1988, charging that certain audio and visual elements, including overlapping windows and the manipulation of icons, were not part of the 1985 agreement that gave Microsoft the

right to use some of Apple's technology. That pact was used in the production of Microsoft's Windows 2.03 and HP's NewWave, which is based on Windows.

In mid-April, Judge Walker declared that many of the Macintosh screen graphics that Apple said the pair copied were either not protected by copyright law or came under the original 1985 technology licensing pact.

That ruling seemed to contradict an opinion that Judge Walker issued last year in which he upheld Apple's contention that the visual elements of the Macintosh screen display were not part of the 1985 licensing pact.

Sour taste

The lengthy seesaw courtroom battle has been frustrating for Apple, which is losing confidence in its ability to have Judge Walker see things its way. "We're disappointed by the decision," Apple spokeswoman Cindy McCaffrey said. "But we never based any of our business plans or goals on a

victory in this case. So at this point nothing changes."

Microsoft also indicated that the decision would not have an impact on operations. "It's business as usual," Microsoft spokesman Collins Hemingway said. "We believe that we are free and clear as far as Windows."

The case still has a long way to go before it is resolved. Walker still did not rule on whether the other 23 disputed items in the newer Windows 3.0 — which ranges from proportional fonts to the use of muted color tones and the program's file manager — infringe on Apple copyrights. He also left open the question of whether HP has the right to use the same on-screen trash can symbol that the Macintosh uses to delete information.

Both sides have until Aug. 28 to respond to Judge Walker's latest decision. At that time, Apple must decide whether to pursue the suit, drop it or risk an appeal that could expand the decision from the specifics of this case to

the generalities of look and feel. "It would be embarrassing for them to have the Court of Appeals affirm Judge Walker's decision," said Lee T. Gesmer, partner at Lucash, Gesmer & Updegrave in Boston.

Could drop prices

Indeed, an Apple defeat would not only mean business as usual but could also lower some software prices because it would encourage developers to craft applications with capabilities similar to those of the Macintosh. But if Apple prevailed, it could squeeze huge damage or royalty payments out of Microsoft and HP.

Apple has previously estimated the amount of the alleged infringement at \$5.55 billion in lost revenue.

Legal experts also said that an Apple victory could have had a dramatic effect on the industry because the Cupertino, Calif., firm would have gained control over critical computer technology.

Economy causes decline in mergers, acquisitions

BY KIM S. NASH
CW STAFF

FORT LEE, N.J. — The sad economy, among other factors, has thrown cold water on last year's deal-wheeling enthusiasm in the computer industry. Although companies are forming lots of technology-swap partnerships, the volume and value of mergers and acquisitions dropped like bricks during the first half of the year, according to a recent report from Broadview Associates, Inc., an investment banking firm.

The number of mergers and acquisitions contracts signed from January through June fell 23% to 227 this year, down from 295 deals inked during the same period in 1991.

Meanwhile, cash value plummeted about 50%. Mergers and acquisitions activity amounted to \$9 million for the first half of this year, compared with \$17.8 million for the first half of 1991. But much of the disparity is due to the \$7.5 million deal between AT&T and NCR Corp., which artificially inflated 1991 figures, Broadview said.

Mergers and acquisitions activity probably will not dip any fur-

ther, according to Paul Deninger, Broadview's managing director. Today's partnerships are crafted to take companies into new markets or to improve economies of scale, Deninger said, citing the merger between Goal Systems International, Inc. and Legent Corp. announced in April and completed this month. "Those kind of strategic deals won't stop," he said.

Reasons why

Other factors contributing to the slowdown this year include the following:

- Fewer outsiders are elbowing into the computer industry. Companies such as McDonnell Douglas Corp. and Lockheed Corp. invested heavily in computer sectors during the past few years as a way to diversify and decrease dependence on the dipping aerospace business. But now they are vacating the information technology arena.

"They just didn't have the

technological savvy necessary to run computer companies," Deninger said. Other outsiders saw those deals disintegrate and decided not to get involved, he explained.

- U.S. firms in general are hanging on to the status quo, waiting for Wall Street predictions of an economic spark in this year's second half to ignite.

Picking a winner is all but impossible this year, Deninger said. Growth rates in all sectors have

tential moves until after the November presidential election, when the fate of the capital gains tax and others is clearer.

- Private companies that may have sought out partnerships to raise cash decided to jump into the booming market for computer-related initial public offerings early this year. However, investor cordiality waned after March.

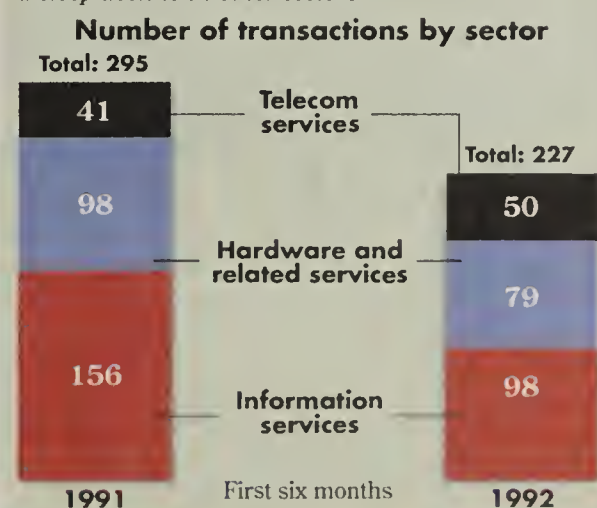
"That window of opportunity is closed indefinitely," Deninger said.

Networking and peripherals firms show more deal-making promise than systems and applications makers. Companies specializing in data communications products, such as Wellfleet Communications, Inc. and Cisco Systems, Inc., are in "fine" financial shape, Deninger said. He would not go so far as to say these companies are in play, but added that if "anyone is to get any deals going, it would be in this healthy sector."

Unlikely to be acquired or to merge — despite the scuttlebutt that flies every few months — is Novell, Inc., Deninger said. "Novell can't be acquired. It's too damn expensive," he said. "Who's got an extra \$8 billion laying around?"

No big deal

An increase in telecom service deals was offset by a steep decline in other sectors



Source: Broadview Associates

CW Chart: Michael Siggins

been less dramatic than in the near past, which may have put a pall over enthusiastic risk-taking among deal makers.

Politics has also played a role. Entrepreneurs are delaying po-

WYSIWYG



Michael Lans

Manager of Applied Information Technology
Brunswick Corp.
Skokie, Ill.



Red or read

As part of its exhibit, "Revelations from the Russian Archives," The Library of Congress is electronically disseminating formerly secret Soviet documents through America Online, Internet and Sovset. Included are materials from Stalin's reign of terror, the workings of the secret police, the 1962 Cuban Missile Crisis and Chernobyl.

Trade show no-show

Be wary of those attendance figures quoted by trade show managers because nearly half the time they are inflated. There are two types of deceptions:

- The "full-figure fake," where the figure includes not only the target audience but also such nonbuyers as spouses, students, exhibit personnel and the press.
- The "registration sidestep," where the show manager quotes registration figures as attendance, without accounting for no-shows.

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

Quips & Quotes

When computers crash "people lose billions of words that can never be retrieved by the user. Since it is lighter than air, this material rises and creates big black holes in the sky."
Columnist Art Buchwald on what really causes damage to the ozone.

The Dan Quayle Spelling Bee Award

The news media could use a little dose of that zero-defect, Total Quality Management religion. A search of the Dow Jones News/Retrieval database turned up 161 mentions of the phrase "Baldrige quality award." Of course, the famous quality award is named after the late Malcolm Baldrige — with just one "d."



B.D.U.s*

"When we had the Michelangelo virus scare, one of our users said, 'With the number of computers we have in the plant, how many people are going to get sick?'"

*From Bill Smith
AM General Corp.
Mishawaka, Ind.*

"One of our programmers, on the phone with one of our software users, was trying to help the user out with a problem and told the user to hit any key. To which the user replied, 'Where's the N.E. key?'"

*From Guido Branca
Director, After Sales Services
Network Management Services Group
New York*

*Brain Dead Users

Sources: *Successful Meetings* magazine, May 1992; *The Washington Post* [June 2, 1992].

INSIDE LINES

Wan Wang

► Talk about a bankruptcy filing from beleaguered Wang raged on last week as the company's year-end results failed to surface. Scuttlebutters said Wang's local printer delivered 4,200 copies of certain forms and packets Wang usually hands out to employees receiving termination notices. Wang cut 1,000 workers earlier this year. Sources close to the company said another 4,200 layoffs are in the works. This could force Wang to pay out \$126 million, triggering default of its loan covenants and possibly causing creditors to call in their notes.

Separate 'til the end

► Will IBM include OS/2 in a possible PC division spin-off? James Cannavino, general manager of the Personal Systems Division, said a more autonomous PC group would not be responsible for OS/2. "The software development team hasn't been part of that business, and it's my intention they won't be," Cannavino said. The goal is to make the PC hardware effort a scrappy, independent group that can more quickly react to competitors.

Getting very graphical

► Microsoft will offer yet another sneak peek of Windows NT at the Windows and OS/2 Conference in

Boston this week. The company is preparing to show some NT features that previously have not been showcased in demos. These include system management features such as software distribution, performance monitoring and inventory control, says Dwayne Walker, Microsoft's director of Windows NT and networking products. Meanwhile, IBM is planning to present the one millionth copy of OS/2 2.0 to customer Caterpillar, Inc. In addition, Software Publishing Corp. is slated to unveil SuperBase IV Version 2.0. The upgraded package, which lists for \$795, is said to include an improved user interface and connectivity.

Magnifying glass necessary?

► HP Vice President Bob Frankenberg teased attendees at a recent technology conference with details of its next-generation palmtop. Frankenberg said the company within six months will introduce a word processing version of its 95LX that will be capable of running Windows, will offer almost a full-size keyboard and will be in an "affordable" price range. Within two years, HP will have a version that offers a full-color display and two-way communication, he said.

No longer a peer

► John Hunter, IBM's director of architecture and telecommunications, jumped ship last week and headed for Landmark Systems, a small IBM-compatible software company in Vienna, Va. Hunter directed development of critical architectures such as APPN and IBM's multivendor networking "blueprint." He will be

succeeded by Rick McGee, who oversaw the same basic areas in his former job, at a slightly lower organizational level, an IBM spokeswoman said. IBM would not comment on Hunter's reason for leaving, but industry scuttlebutt has it he took advantage of IBM's voluntary severance program.

A CASE for change

► Paul Hessinger flew the coop as chief technologist at Softlab, a CASE company owned by Germany's BMW. He replaces Pete Privateer, former strategic product planner at rival KnowledgeWare. Softlab offered in excess of \$350 million to buy out KnowledgeWare five months ago, but the two companies couldn't come to terms. Hessinger will handle a combination of R&D and product positioning, according to a source within the Atlanta-based company.

Counterfeit versions of PKWARE, Inc.'s PKZIP data compression software are showing up on bulletin boards, according to a report by the Computer Incident Advisory Capability at Lawrence Livermore. Use of PKZIP files labeled PKZ201.ZIP, PKZ201.EXE, PKZIPV2.ZIP or PKZIPV2.EXE can lead to damage of hard disk data. PKWARE reports that the current version of PKZIP is 1.10. Know of any pilfered software? Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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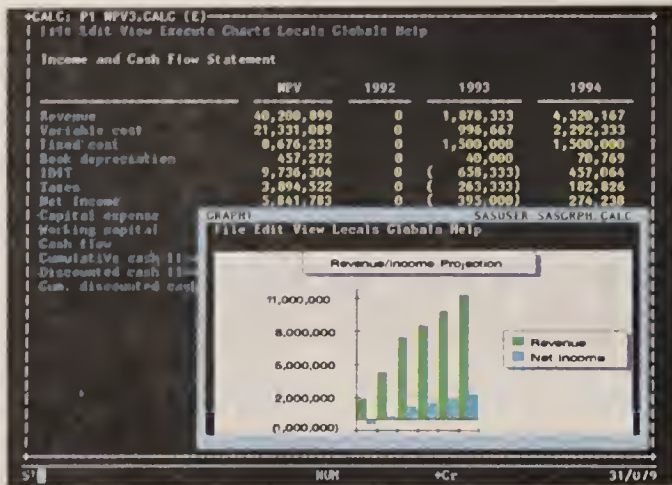
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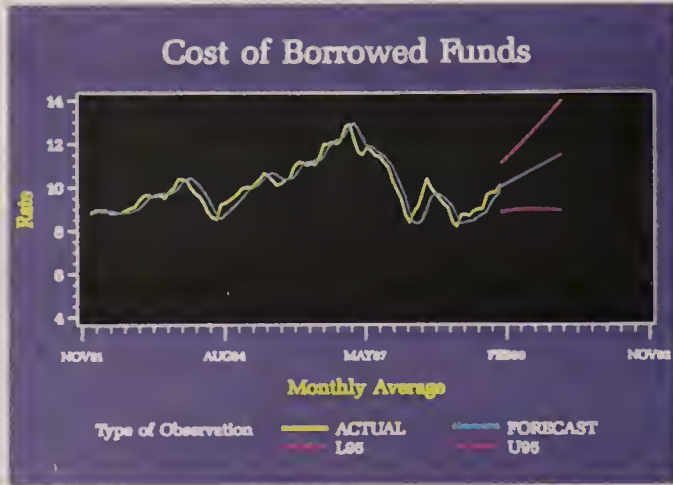
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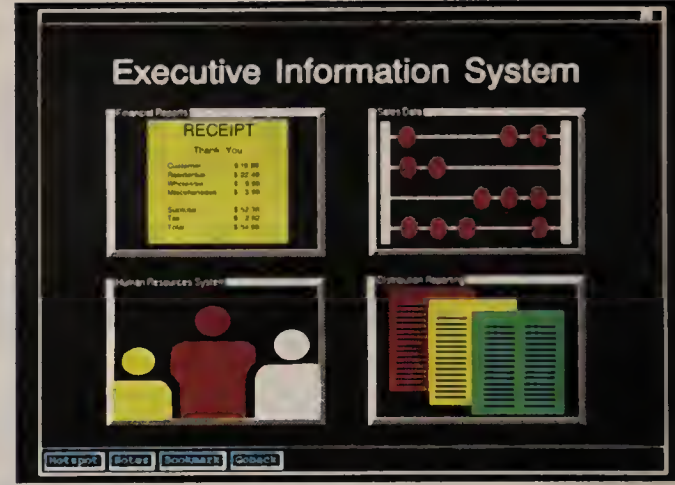




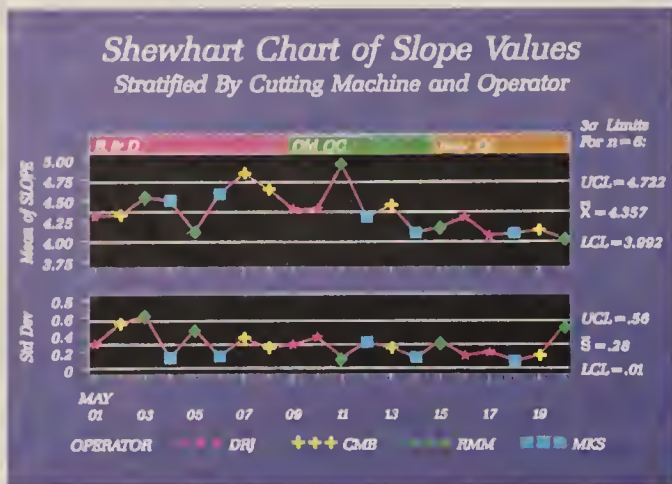
Financial Planning



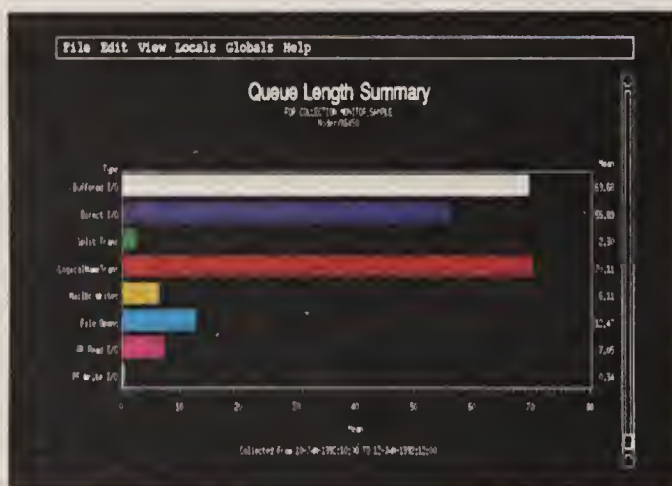
Econometric and Time Series Analysis



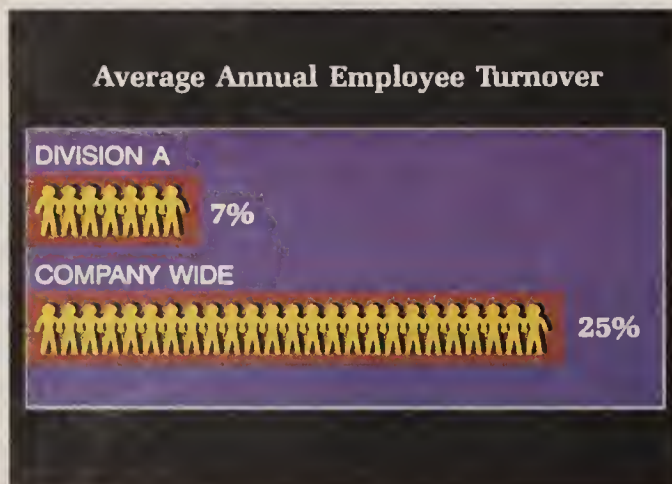
Executive Information Systems



Quality Improvement



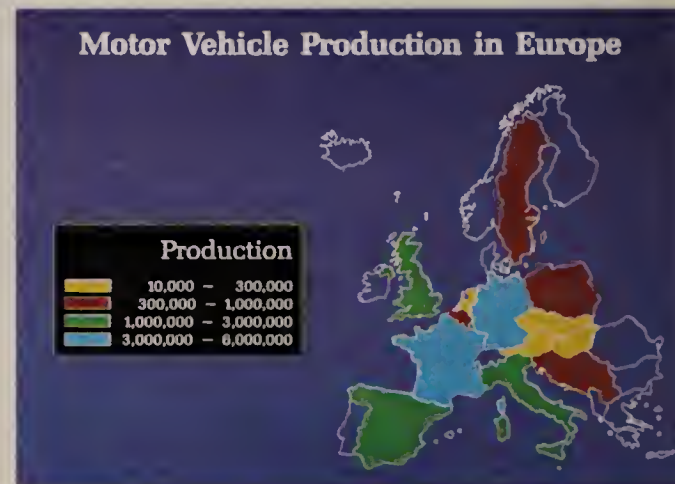
Computer Performance Evaluation



Reporting



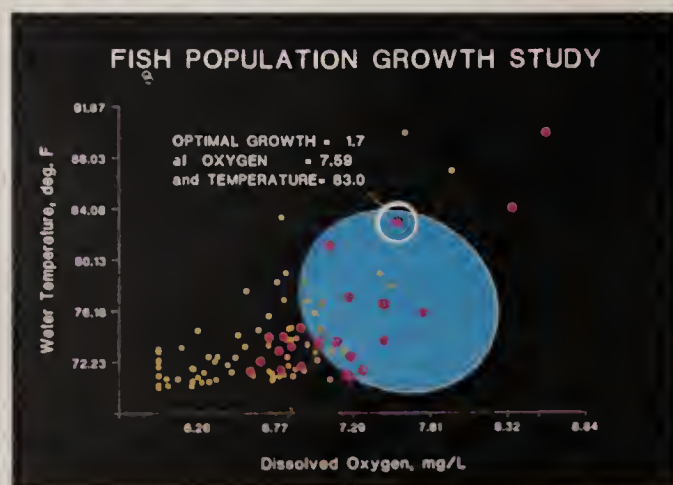
Market Research



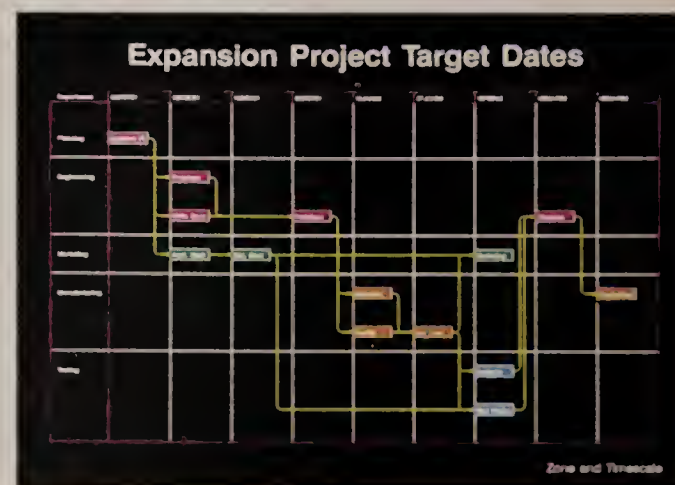
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